

**TENTATIVE MAP
DRAINAGE STUDY
for
FALLBROOK OAKS**

Community of Fallbrook, California

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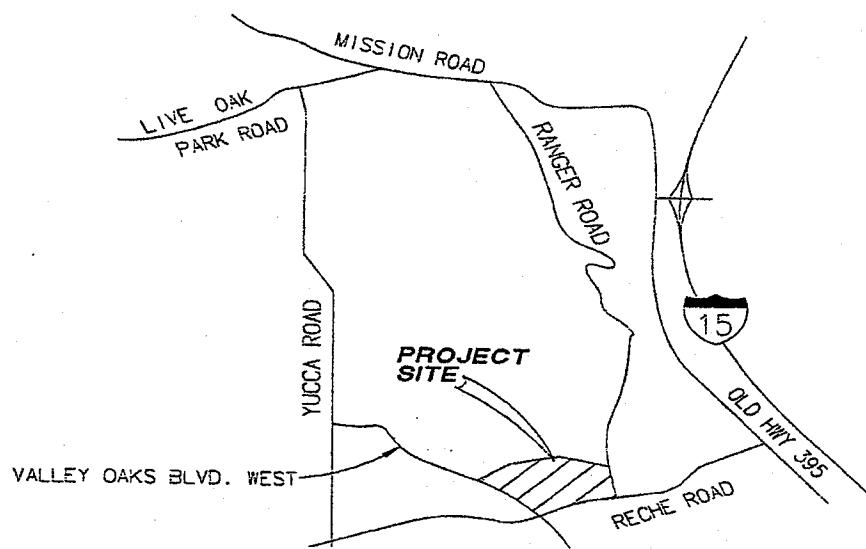
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CHAPTER 1 - EXECUTIVE SUMMARY

1.1 Introduction

The Fallbrook Oaks project site is within the unincorporated San Diego County community of Fallbrook, California, approximately 6 miles northwest of the Interstate 15 and Highway 76 intersection (see Vicinity Map). It is bounded to the east by Ranger Road, to the west by Valley Oaks Blvd West and to the south by Reche Road.



VICINITY MAP

NTS

This CEQA-level drainage study analyzes the 100-year peak flow rates for the existing conditions and the existing conditions-plus-proposed project, and calculates the 100-year flood lines of inundation. This project has been redesigned to eliminate the stormwater detention basin, to eliminate diversions of stormwater flows, and to eliminate adverse hydrologic effects of development.

Since the site lies outside any FEMA floodplain zones, no Letters of Map Revision will be required. Treatment of stormwater runoff from the site has been addressed in a separate Storm Water Management Plan dated October 10, 2008 by Winton Engineering, Inc.

The applicant is required to evaluate and compare before-development (existing) and after-development (existing-plus-project) peak stormwater runoff conditions. Since the tributary basins related to this project are greater than 1

square mile, the NRCS hydrologic method from the 2003 San Diego County Hydrology Manual is used for the computation of design rainfall events, using runoff coefficients and criteria from said Manual. A more detailed explanation of the methodology used for this analysis is contained in Chapter 2 of this report.

This NCPS method is a sophisticated and accurate calculational algorithm which accurately models and compares the existing hydrologic conditions and the existing-plus-project hydrologic conditions of this project.

This report analyzes the hydraulic flow of the 100-year storm (areas 25 acres and larger) through the two (2) natural drainage courses within the project, and shows the flood inundation lines.

1.2 Summary of Existing Conditions

(Note: This Fallbrook Oaks site was burned by the October 2007 Rice Canyon Fire, and these descriptions of "existing conditions" herein are for the pre-fire vegetation conditions.)

The existing site is vegetated with annual grasses, ribbons of oak trees along drainage courses, abandoned orchard areas, and contains an old, unoccupied residence planned for demolition [burned by fire]. The topography gently slopes in westerly, easterly, and southerly directions, and the natural site runoff discharges into and through natural drainage courses which run toward the south of the proposed project site.

The majority of runoff from the existing condition (and existing-plus-project) comes from upstream tributary areas, north and southwest of the project site. These tributary areas consist of naturally vegetated land, several small orchards, and single family dwellings, as well as paved roads and dirt roads.

The Fallbrook Oaks project area currently discharges into and through natural drainage courses which run toward the south and Reche Road. At Reche Road, stormwater flows through three (3) existing culverts, two (2) 72" CMP and one (1) 54" CMP. The flow paths of these three (3) tributary drainage areas combine downstream (south) of Reche Road. At this downstream offsite location, the natural flow paths have been rerouted by previous grading and development of the Valley Oaks Trailer Park. This report identifies the three (3) contributing tributary hydrologic basins in the Fallbrook Oaks vicinity as the "Eastern Canyon" (54" CMP), the "Central Canyon" (72" CMP) and the offsite "Western Canyon" (72" CMP).

These hydrologic basins ultimately drain to the San Luis Rey River.

The US Army Corps of Engineers hydrology program, HEC-HMS, was used to model the runoff response using the Soil Conservation Service Hydrologic Method (also known in the County Hydrology Manual as

the "NRCS hydrologic method") for the analysis of the 100-Year storm event and existing conditions. From the Soil Conservation Service Soil Maps, a type "C" soil group was determined for the project area. Per the 2003 San Diego County Hydrology Manual, a runoff curve number of 77 was determined to represent the existing conditions of vegetated areas in the tributary basins. The County method uses a 24-hour storm hydrograph, with a 100-year rainfall depth for the site of 5.5 inches (P_{24}).

The US Army Corps of Engineers river hydraulic program, HEC-RAS, was used to calculate how the 100-year storm (from areas 25 acres and larger) runs through the site, and to determine and plot the flood inundation lines (see Chapter 14 for map of lines of inundation). Chapter 3 has the description of these calculations. Please note that although such calculations are titled "After Development", because the Pre-Development and Post-Development Qs are the almost equivalent, the calculated flood inundation lines are essentially valid for the existing pre-development conditions.

An important fact that emerged from this hydraulic study is that the 100-year flood in the East Canyon, overflows into the Center Canyon at one location just north of the former building site. Thus this report will specify the calculation summaries that are based solely upon the hydrology study as "Hydrology" (example - Table 1A), and those that are modified by the results of the hydraulic calculations "Hydraulic" (example - Table 1B).

The existing culverts were built pursuant to Road Survey No. 746 by the County of San Diego, circa 1959. At the County's request, and because of the era of the pipes installation, hydraulic calculations were also performed to estimate the capacities of the existing pipe culverts to convey the 100 year storm without overtopping (see Section 2.5). The existing culverts are too small to convey the existing, undeveloped 100-year flows. (Additionally, heavy rains during the time that the area is denuded by the fire will cause even greater runoff). The results are summarized in Tables 1A and 1B below. Please refer to subsequent Chapters for existing condition HEC-HMS hydrology information.

Table 1A - Summary of 100-Year Existing Conditions (Hydrology)

<u>Canyon</u>	<u>Drainage Area</u> (Ac)	<u>Peak Flow</u> (cfs)	<u>Time to Peak Flow</u> (hr:min)	<u>Pipe Size</u> (in.)	<u>Pipe Capacity</u> (cfs)
Eastern	138.5	466.8	16:00	54	170
Central	264.1	803.8	16:05	72	330
Western	<u>281.3</u>	<u>860.5</u>	<u>16:05</u>	<u>72</u>	<u>525</u>
Total	683.9	2,131.1	-	-	1,025

Table 1B - Summary of 100-Year Existing Conditions (Hydraulic)

<u>Canyon</u>	<u>Drainage Area (Ac)</u>	<u>Peak Flow (cfs)</u>	<u>Over Flow (cfs)</u>	<u>Peak Flow (cfs)</u>	<u>Time to Peak Flow (hr:min)</u>	<u>Pipe Size (in.)</u>	<u>Pipe Capacity (cfs)</u>
Eastern	138.5	466.8	-253	213.8	16:00	54	170
Central	264.1	803.8	+253	1056.8	16:05	72	330
Western	<u>281.3</u>	<u>860.5</u>	<u>-</u>	<u>860.5</u>	<u>16:05</u>	<u>72</u>	<u>525</u>
Total	683.9	2,131.1	---	2,131.1	-	-	1,025

1.3 Summary of Proposed Development

The development project as proposed consists of 19 lots, 1-acre minimum area, within the 27-acre site. The development lies within 3 drainage basins, identified in this report as the eastern, central, and western canyons.

The eastern portion of the development will drain to an existing natural drainage course, and flow in a southerly direction, combining with the large upstream flow before reaching the existing culvert (54" CMP) within the adjacent Reche Road.

The central portion of the development will drain via a private street, grass swales, private inlets and pipes, and discharge to a second existing natural drainage course, where it combines with the large upstream flow before reaching the existing culvert (72" CMP) within Reche Road.

The western portion of the development will drain via Valley Oaks Boulevard (private road) and grass swales, discharging to a new storm drain system in Valley Oaks (and Reche Road). This storm drain will then convey the developed site flow in a westerly direction, discharging to a third existing natural drainage course, and combining with the large offsite flow at the existing culvert (72" CMP) within Reche Road.

This Fallbrook Oaks subdivision has been redesigned to eliminate the stormwater detention basin, to eliminate diversions of stormwater flows, and to eliminate adverse hydrologic effects of development. The project incorporates grass swales within the lots, and grass swales along the private roads (and Ranger Road), as well as rock-lined earth swales to treat and infiltrate stormwater. Gunite or concrete ditches are not proposed.

85th percentile runoff flows will be treated by storm water BMP(s) prior to discharging into the existing natural drainage systems per the Storm Water Management Plan by Winton Engineering, Inc., dated October 10, 2008.

HEC-HMS was used to model the runoff response for existing-plus-project conditions, using the Soil Conservation Service Hydrologic Method ("NRCS hydrologic method") for the analysis of the 100-Year storm event. From the Soil Conservation Service Soil Maps, type "C" soil group was determined. Per the Manual, a runoff curve numbers of 84 was determined to represent the developed on-site vegetated conditions, and roofs and concrete were assigned curve numbers of 99, with non-disturbed areas remained at the existing-condition curve number of 77. The County method uses a 24-hour storm hydrograph, with a 100-year rainfall depth for the site area of 5.5 inches (P₂₄).

The US Army Corps of Engineers river hydraulic program, HEC-RAS, was used to calculate how the 100-year storm (from areas 25 acres and larger) runs through the site, and to determine and plot the flood inundation lines (see Chapter 14 for map of lines of inundation). Chapter 3 has the description of these calculations.

An important fact that emerged from this study is that the 100-year flood in the East Canyon, overflows into the Center Canyon at one location just north of the former building site. This is an existing condition without any contribution from the proposed development. The area of the overflow is within the biological open space area, and therefore no construction or grading is proposed to change this existing condition.

Because of the overflow from the East Canyon to the Center Canyon, this report will specify the calculation summaries that are based solely upon the hydrology study as "Hydrology" (example - Table 2A), and those that are modified by the results of the hydraulic calculations "Hydraulic" (example - Table 2B).

Runoff from post-development (existing-plus-project) conditions are less than the pre-development (existing) condition runoff. The reduction in post-development runoff is due to four basic factors. First, the large, flat pads and maintained landscaping create soil and cover conditions that are better than the sloping existing conditions, increasing surface storage and infiltration. Second, the lot drainage design maximizes surface storage and infiltration through long lengths of grassy swales, and routing the runoff through these long grassy swales increases the time of concentration. Third, when the runoff leaves the lots, it again runs in earth swales (grass or rock) along the roads, again maximizing infiltration and increasing the time of concentration. Finally, the effect of the overall subdivision configuration and grading is to increase the time of concentration because the drainage paths for the post development condition are much longer than in the natural condition (please refer to Section 2.1 for additional discussion of these factors).

Runoff from post-development (existing-plus-project) conditions are reported in Table 2A below. Please refer to subsequent Chapters for

developed condition HEC-HMS information.

Table 2A - 100-Year Existing-plus-Project Conditions (Hydrology)

<u>Canyon</u>	<u>Drainage Area</u> (Ac)	<u>Peak Flow</u> (cfs)	<u>Time to Peak Flow</u> (hr:min)	<u>Pipe Size</u> (in.)	<u>Pipe Capacity</u> (cfs)
Eastern	138.5	458.7	16:00	54	170
Central	264.1	803.7	16:05	72	330
<u>Western</u>	<u>281.3</u>	<u>853.8</u>	<u>16:05</u>	<u>72</u>	<u>525</u>
Total	683.9	2,116.2	-	-	1,025

Table 2B - 100-Year Developed Conditions (Hydraulic)

<u>Canyon</u>	<u>Drainage Area</u> (Ac)	<u>Peak Flow</u> (cfs)	<u>Over Flow</u> (cfs)	<u>Peak Flow</u> (cfs)	<u>Time to Peak Flow</u> (hr:min)	<u>Pipe Size</u> (in.)	<u>Pipe Capacity</u> (cfs)
Eastern	138.5	458.7	-253	205.7	16:00	54	170
Central	264.1	803.7	+253	1056.7	16:05	72	330
<u>Western</u>	<u>281.3</u>	<u>853.8</u>	<u>-</u>	<u>860.5</u>	<u>16:05</u>	<u>72</u>	<u>525</u>
Total	683.9	2,116.2	-	2,116.2	-	-	1,025

Sizing Inlets and Pipes

Standard hydraulic calculations were performed to verify size of inlets, pipes, and swales, (post-development) and to report Qs and velocities at points of discharge. The V-type brow ditch along the northerly boundary is proposed in dimension as a Standard Drawing D-75 Type A, however, it is proposed to be a rock-lined earth ditch rather than gunited or concreted.

As shown in Table 3, the project will build a D-41 Energy Dissipator and accompanying riprap protection at the discharge point for the Lot 4/5 private stormdrain. Responsibility for maintaining the private storm drains will be covered by the project CC&Rs.

The calculations are in Sections 2.6, 2.8, and 2.9, and are summarized in Table 3 below. "Build" means proposed construction responses to indicated velocities.

Table 3 - Discharge Points, 100-Year Developed Conditions

<u>Location</u>	<u>Hydrol. ID</u>	<u>Drainage Area (Ac)</u>	<u>Peak Flow (cfs)</u>	<u>Peak Flow (hr:min)</u>	<u>Time to Pipe</u>	<u>Pipe Size (in.)</u>	<u>Pipe Vel. (fs)</u>	<u>Build</u>
Lot 4/5 pipe	Pipe1	2.7	7.22	16:00 Note 1		18	15.0	D-41 + 1-ton riprap
Valley Oaks/ Reche Road	18-166 Pipe159	10.2	31.8	16:00		18 (x2)	7.5	#2 back'g riprap
Brow ditch West	note 2	0.1	0.32	16:05		V	2.1	nothing ditch
Brow ditch East	note 3	0.2	0.65	16:05		V	3.2	nothing ditch

Table 3 Notes:

Note 1: It was requested to that this report contain a summary table for post-development “H, L, C, Tc, I, A, V, Q” for each drainage discharge point. V and Q are provided in Table 2C as requested.

“H, L, C, Tc, I” are factors of a Rational Formula hydrology analysis. As discussed in Section 2.1, this study uses the the NRCS hydrologic method US Army Corps of Engineers hydrology program, HEC-HMS, and the Soil Conservation Service Hydrologic Method (also known in the County Hydrology Manual as the “NRCS hydrologic method”).

These Rational Formula factors are not directly comparable to HEC-HMS input. I have extracted the Qs from the data (as shown) and used that to calculate velocities of flow.

H: Height differential for basin, used to estimate Tc. HEC-HMS uses “slope” and “Length” of drainage “planes” and channels within a basin to model rainfall/runoff characteristics. This data for each hydrologic area is shown in the attached Chapters of Hydrology Results, however, effective or average values at a node or junction is not available.

L: Length along basin, used to estimate Tc. HEC-HMS uses “Length” of drainage “planes” and channels within a basin to model rainfall/runoff characteristics. This data for each hydrologic area is shown in the attached Chapters of Hydrology Results, however, effective or average values at a node or junction is not available.

C: Coefficient of runoff. HEC-HMS uses “Curve Numbers” in a similar way to model rainfall/runoff. This data for each hydrologic area is shown in the attached Chapters of Hydrology Results, and discussed in Section 2.4, however, effective or average values at a node or junction (for all areas tributary for to it) are not available.

Tc: Time of concentration. Time for a drop of excess rain to run from the most remote location, to the point of interest. HEC-HMS does not use this concept.

In the various Tables, I have shown the time of the maximum Q for an area, for example, 16:00 (16 hours, 00 minutes....within a 24-hour storm). The indicated 24-hour depth of

rain (ex: $P_{24} = 5.5$ inches) is distributed over the 24 hours, but not uniformly. The most intense rainfall starts about 15:30, and increases until about 16:00. Since most of the peaks are in the 16:00 to 16:10 range, response times or "times of concentration" for smaller areas fall roughly in the 5-minute to 40-minute range, but cannot be definitively stated.

I: Intensity of rainfall. HEC-HMS does not use this concept in the same way as the Rational Formula method..

In the various Tables, I have shown the time of the maximum Q for an area, for example, 16:00. The most intense rainfall starts about 15:30, and increases until about 16:00. Intensities can be calculated for 5 minute, 10 minute, etc storms, but without a specific T_c , such intensities are not useful.

Note 2: Please refer to Section 2.9

Note 3: Please refer to Section 2.9

1.4 Summary of Results

Tables 4 and 5 summarize the existing and existing-plus-project (“developed”) condition drainage areas and resultant 100-year peak flow runoff rates at the three (3) discharge locations that are common between the existing condition and the post-development condition.

Table 4 - Summary of 100-Year Existing and Developed Conditions (Hydrology)

<u>Canyon</u>	Exist'g Drainage <u>Area</u> (Ac)	Exist'g Peak <u>Flow</u> (cfs)	Develop. Drainage <u>Area</u> (Ac)	Develop. Peak <u>Flow</u> (cfs)	Pipe Size (in.)	Pipe Capacity (cfs)
Eastern	138.5	466.8	138.5	458.7	54	170
Central	264.1	803.8	264.1	803.7	72	330
<u>Western</u>	<u>281.3</u>	<u>860.5</u>	<u>281.3</u>	<u>853.8</u>	<u>72</u>	<u>525</u>
Total	683.9	2,131.1	683.9	2,116.2	-	1,025

Table 5 – Comparison of Post- and Pre-Development Conditions (Hydrology)

<u>Canyon</u>	Drainage <u>Area</u> (Ac)	100-yr <u>Peak Flow</u> (cfs)	Time to <u>Peak</u> (hr:min)
Eastern - Existing	138.5	466.8	16:00
<u>Eastern – Develop.</u>	<u>138.5</u>	<u>458.7</u>	<u>16:00</u>
Difference - %	0	- 1.7	0
Central - Existing	264.1	803.8	16:05
<u>Central – Develop.</u>	<u>264.1</u>	<u>803.7</u>	<u>16:05</u>
Difference - %	0	- 0.01	0
Western - Existing	281.3	860.5	16:05
<u>Western – Develop.</u>	<u>281.3</u>	<u>853.8</u>	<u>16:05</u>
Difference - %	0	- 0.8	0
Total - Existing	683.9	2,131.1	--
<u>Total – Develop.</u>	<u>683.9</u>	<u>2,116.2</u>	<u>--</u>
Difference - %	0	- 0.7	0

Table 3 summarizes the existing-plus-project (“developed”) condition drainage areas and resultant 100-year peak flow runoff rates at the four (4) discharge locations that are solely post-development conditions.

Table 3 - Discharge Points, 100-Year Developed Conditions

<u>Location</u>		<u>Hydrol. ID</u>	<u>Drainage Area (Ac)</u>	<u>Peak Flow (cfs)</u>	<u>Peak Flow (hr:min)</u>	<u>Time to Pipe</u>	<u>Pipe Size (in.)</u>	<u>Vel. (fs)</u>	<u>Build</u>
Lot 4/5 pipe	Pipe1		2.7	7.22	16:00 Note 1		18	15.0	D-41 + 1-ton riprap
Valley Oaks/ Reche Road	18-166 Pipe159		10.2	31.8	16:00		18 (x2)	7.5	#2 back'g riprap
Brow ditch West	note 2		0.1	0.32	16:05		V ditch	2.1	nothing
Brow ditch East	note 3		0.2	0.65	16:05		V ditch	3.2	nothing

As illustrated in Tables 4 and 5 above, the Fallbrook Oaks project does not create any diversion of runoff, the project does not detrimentally change the basin hydrologic response characteristics, and the existing peak flows are higher than the post-development existing-plus-project peak flows for the 100-year design storm event. Therefore, the proposed project will have no impact, and no adverse impact upon the existing pipe culverts or natural drainage systems.

The project contributes lower peak storm runoff to the existing substandard pipes under Reche Road. For this and other reasons, it is agreed that replacement of these old substandard pipes is not the applicant's burden.

The project will construct all other necessary storm drain facilities to capture and safely convey the 100-year storm flows, as identified in this report. Responsibility for maintaining the private storm drains will be covered by the project CC&Rs. As illustrated in Table 3 above, the proposed construction of the Fallbrook Oaks drainage facilities will mitigate the soil-erosion effects from discharging concentrated runoff.

1.5 References

"City of San Diego Drainage Design Manual", City of San Diego Land Development Review Division; April 1984.

"San Diego County Hydrology Manual", County of San Diego Department of Public Works Flood Control Section, June 2003.

"HEC-HMS Modeling System", Version 3.1.0, Hydraulic Engineering Center, US Army Corps of Engineers, November 2006.

"HEC-RAS River Analysis System", Version 4.0, Hydraulic Engineering Center, US Army Corps of Engineers, November 2006.

"Water Quality Technical Report for Fallbrook Oaks", Winton Engineering, Inc, October 10, 2008.

Report on the Calibration Analysis for the San Diego County Hydrology Manual, prepared for the County of San Diego, by Theodore V. Hromadka, II, May 2007

Soil Survey, San Diego Area, CA, by US Department of Agriculture, Soil Conservation Service, December 1973.

CHAPTER 2 - Methodology of Flowrate Determination

2.1 – Project Design Criteria

Design Recurrence Interval

Section 2.3 of the 2003 San Diego County Hydrology Manual (hereinafter “Manual”) and other County standards requires that the 100-year storm be used for analysis and design of facilities upstream of any major public road. This Report conforms and uses 100-year storm values.

Hydrology Methodology

For this report, the US Army Corps of Engineers hydrology program, HEC-HMS (latest version, 3.1.0), was used to model the runoff responses using the Soil Conservation Service Hydrologic Method (also known in the County Hydrology Manual as the “NRCS hydrologic method”).

Section 2.3 of the Manual requires that the NCRS hydrologic method be used for drainage areas of greater than 1 square mile. As shown, the tributary basins comprise 683.9 acres, or 1.07 square miles.

In this case, use of the NCRS hydrologic method is used for two (2) reasons: the basins involved total more than 1 square mile; and use of other methods such as the Rational Method or Modified Rational Method would produce inferior results while artificially constraining the applicant from using a technically more accurate and valid methodology, the NCRS.

The NCRS method in Section 4 of the Manual has a sophisticated and well-accepted process to adjust infiltration rates for soil types, soil groups, vegetative cover, interception rates, storage rates, antecedent moisture conditions, and consequently runoff rates for varying soil, vegetation, and rainfall conditions, during varying-intensity storms modeled in the hydrology calculation. For these and other technical reasons, the NCRS method was used in evaluating this project.

In contrast, although the Rational Method (hereafter “RM”) is sometimes a useful approach, limitations and suspect assumptions of the RM are known.

For example, in Section 3.1.1 (page 4) of the Manual, it states one assumption inherent to the RM is that, “The fraction of rainfall that becomes runoff (or the runoff coefficient, C) is independent of I” [Intensity of rainfall] “or precipitation zone number (PZN) condition...”. As well, the manual suggests via Tables that discrete “C”-factors be used, and those tabled C-factors, being “average” values, are so coarse in application that projects such as this one would be improperly, unfairly, and irrationally prevented from presenting the best possible hydrologic

analysis.

The NCRS creates accurate hydrographs which can be combined at collection points.

However, as Section 3.1.1 (page 3) of the Manual states, the RM does not create hydrographs which can be combined at collection points. This is a critical distinction because, under the RM, the critical times of concentration for this project would be established by the large offsite watersheds, and changes onsite from development would not and could not be reflected accurately in the basin Times of Concentration.

Further, determination of appropriate Times of Concentration (a fundamental input to the RMs) is difficult to determine accurately, somewhat subjective, and therefore problematic. In comparison, with NCRS the apparent Time of Concentration is an output result of the program calculations and detailed input data. With NCRS, characteristics of the numerous sub-basins such as size, surface slopes, length of drainage path(s), nature of drainage path(s), soil type(s), antecedent moisture content, vegetative cover, etc are carefully determined and input to the program, and the program directly calculates and combines the sub-basin runoff values.

Design Philosophy

A portion of the hydrologic design approach for this Fallbrook Oaks project uses the engineering concept of "torturous path", which can be accurately evaluated by the NCRS method, but not the RM methods.

For illustration, in the existing condition, the topography of these lots caused runoff from the soil to flow downhill over a fairly-steep surface (in this context), but not necessarily over a long distance, until the water reaches a concentrated-flow path (rill, swale, drainage course).

Effect: a fairly short Time of Concentration.

Now, assume that the same area as above is developed as graded pads. First, the runoff from the pad, roof and pavement areas is directed along a substantially different path (generally to and along the fronting street) and not rearward over the natural slope. Here the "torturous path" comes into play: instead of the lot being graded so that water is directed immediately toward the street by the shortest path possible, the lot is graded so that a 0.5% earth slope (typically grass-lined) starts near the front of the pad, and runs rearward and across the rear of the pad, and then forward to the street, all at 0.5% grade. Now, in direct comparison with the existing condition, the runoff travels a much longer distance, along a much flatter slope, and usually with superior vegetative cover and soil conditions than the natural or existing conditions. Note also that this longer tortuous path on-pad is followed by the additional length of flow along the private and public

streets, swales and storm drains.

Effect: a longer Time of Concentration than the existing condition.

These two (2) situations can be accurately modeled by the NCRS method and thus compared, but cannot be modeled by the RMs.

2.2 Design Rainfall Determination

The 100-year storm is used in this Report. As reflected in Section 4.1.1 et seq of the Manual, the NCRS method uses a “nested” 24-hour storm. The nested storm is created using the 6-hour 100-year, and the 24-hour 100-year depths of precipitation.

For this project, 1993 County of San Diego Isopluvial maps were used, as opposed to the ones contained in the 2003 Manual. This is because hydrology calculations strictly adhering to the 2003 Manual have been shown to result in calculated runoff rates that are substantially too high when compared to previously accepted calculations.

The Report on the Calibration Analysis for the San Diego County Hydrology Manual, May 2007 by Theodore V. Hromadka, II, prepared for the County of San Diego, concludes (Table 25) that for a particular example where a historic flow would be about $Q_{100} = 12,000$ cfs, the hydrology calculation pursuant to the 2003 Manual results in a $Q_{100} = 18,544$ cfs – a significant discrepancy! And thus, the necessity of a Calibration Analysis.

In this case, the 1993 values were used so that a more realistic (yet conservative) assessment of the capacities of the Reche Road culverts could be made, and the same precipitation values are used in all of the calculations to compare the existing and the existing-plus-development conditions.

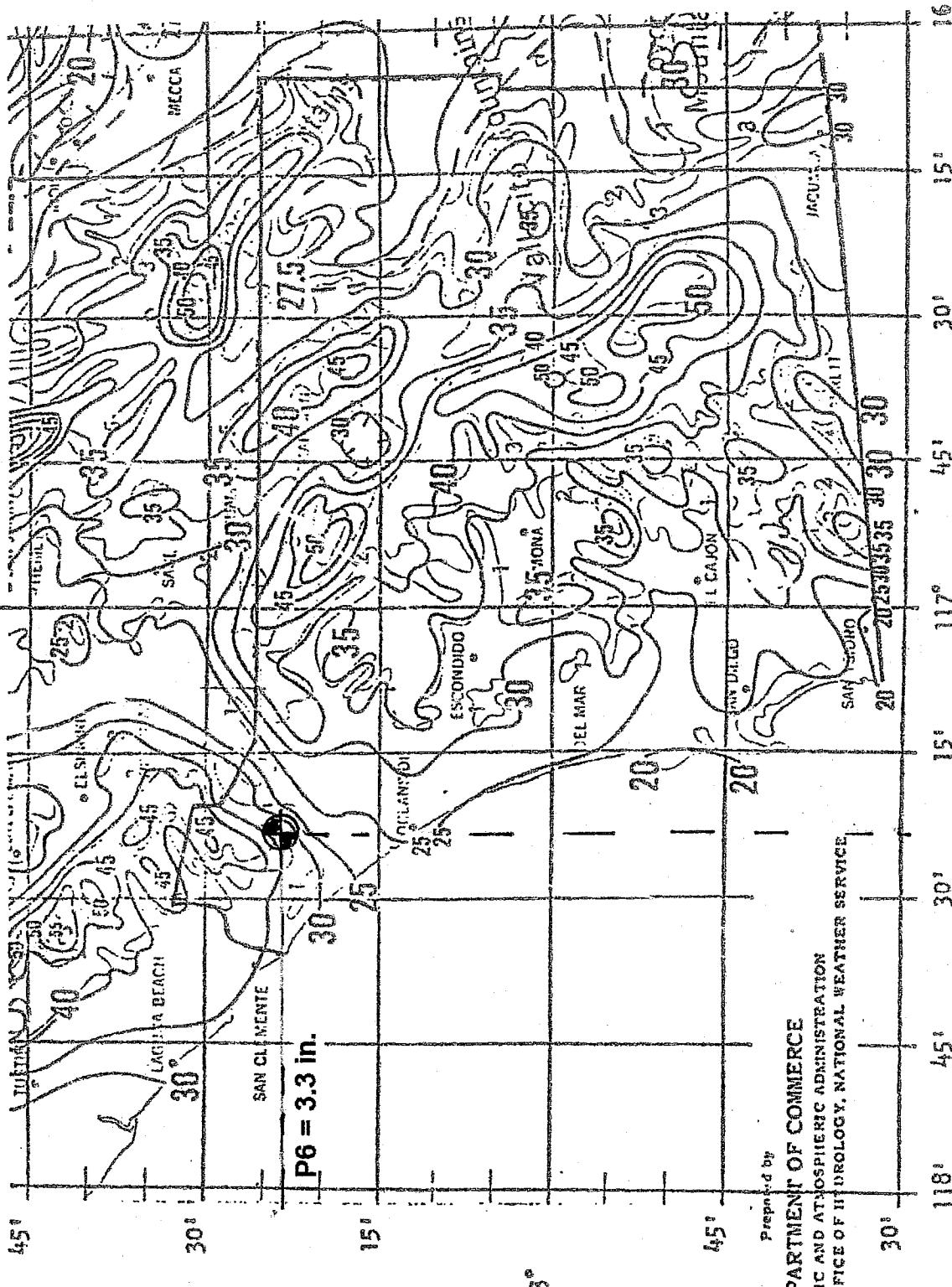
100-Year, 6-Hour precipitation = 3.30 inches

100-Year, 24-Hour precipitation = 5.50 inches

FLOOD CONTROL

100-YEAR 6-HOUR PRECIPITATION
ISOPHIALS OF 100-YEAR 6-HOUR

PRECIPITATION IN INCHES AT 6-HOUR



Prepared by

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
SPECIAL STUDIES BRANCH, OFFICE OF HYDROLOGY, NATIONAL WEATHER SERVICE

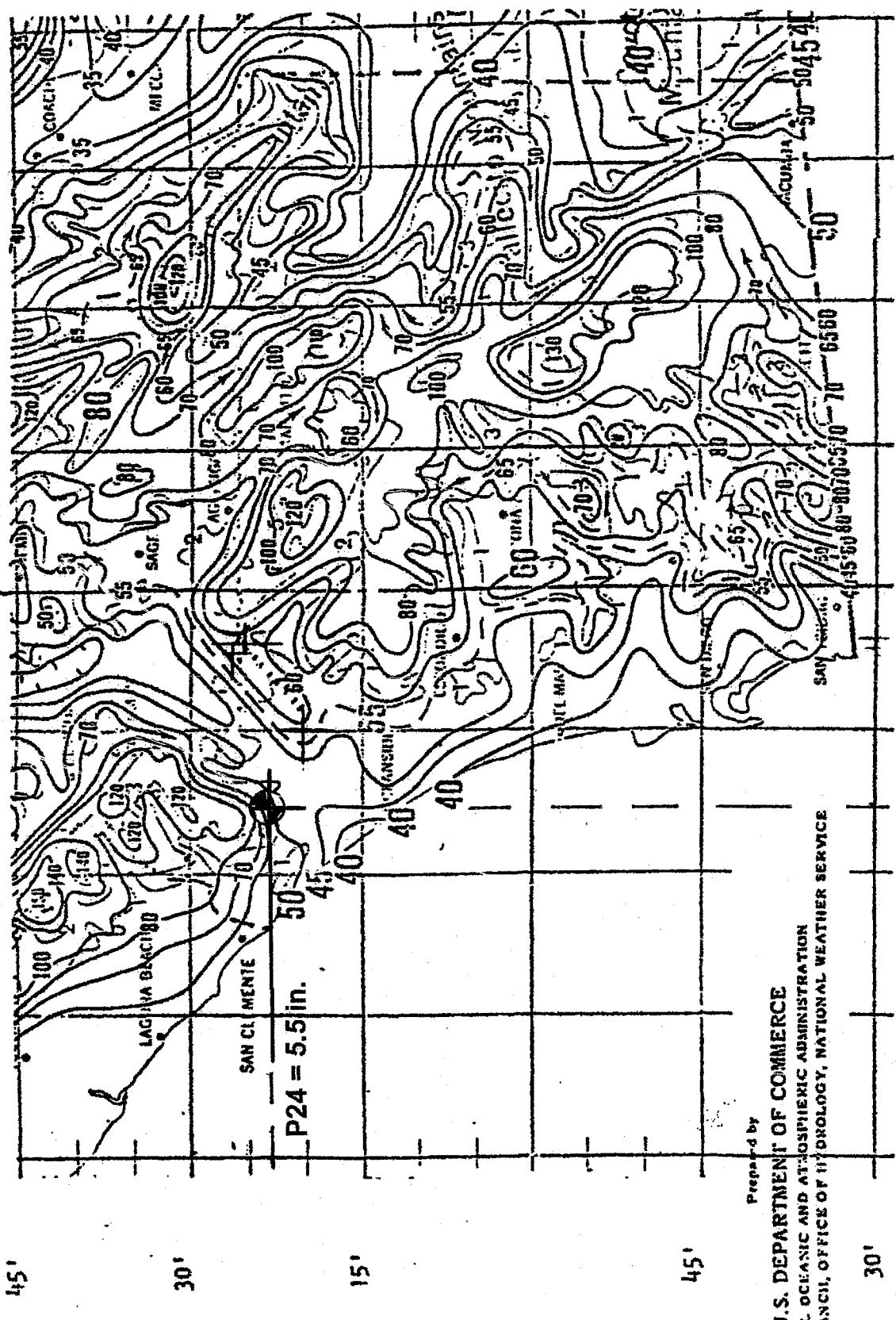
FALLBROOK OAKS

B-1958

COUNTY OF SAN DIEGO
DEPARTMENT OF SANITATION &
FLOOD CONTROL

100-YEAR 24-HOUR PRECIPITATION
ISOPHILIMALS OF 100-YEAR 24-HOUR

PRECIPITATION IN TENTHS OF AN INCH



FALLBROOK OAKS

B-1958

Prepared by
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE
SPECIAL STUDIES BRANCH, OFFICE OF HYDROLOGY, NATIONAL WEATHER SERVICE
SP-1500-B-1958-550-70-6560-3045-21

2.3 Hydrologic Soil Group Determination

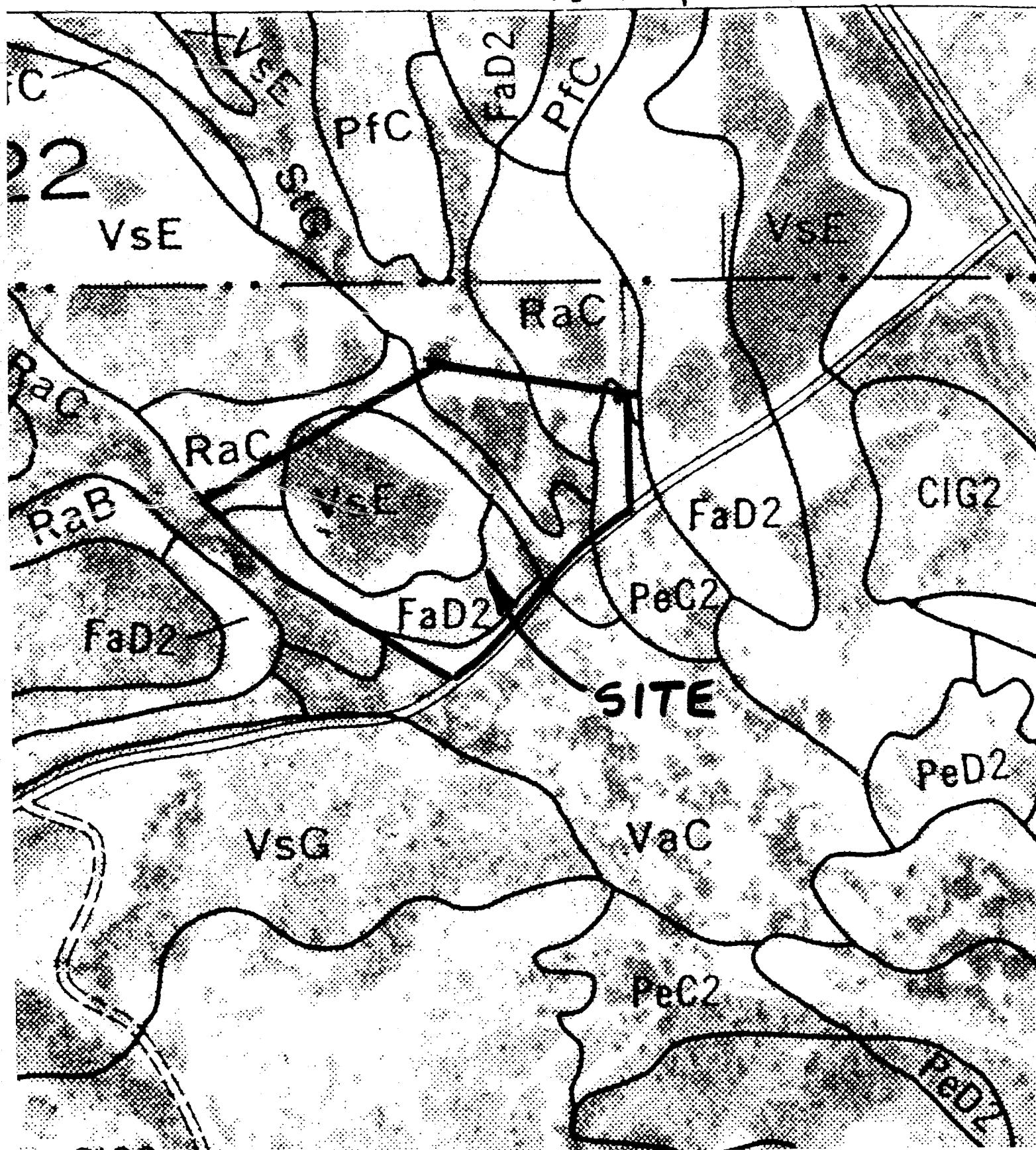
Soils were determined from the USDA Soil Survey, San Diego Area, CA, Sheet No. 12 (Bonsall Quadrangle). This report uses Type C as the hydrologic soil group for existing (onsite and offsite) and existing-plus-development conditions, based upon the data in Table 5 as determined from Sheet 12.

Table 5 - Summary of Hydrologic Soil Group within Project

<u>Soil</u>	<u>Type</u>	<u>% B</u>	<u>%C</u>	<u>%D</u>
FaD2	C	--	20.4	--
PeC2	D	--	--	5.3
stG	D	--	--	15.4
VsE	B	34.4	--	--
RaC	C	--	21.8	--
VaC	B	2.7	--	--
		37.1	42.2	20.7

drangle)

USDA SOIL SURVEY, SHT. 12



2.4 Curve Number Determination

Hydrologic Curve Numbers (“CNs”) were developed from Tables 4-2, 4-6 of the Manual, the orthophoto sheets, and site reconnaissance.

Subbasin “cover treatments” and “practices” were determined for the tributary basins, and initial CNs for those covers were determined for Soil Group C soils, from Table 4-2. By estimating areal percentages, an unadjusted CN of 65 was calculated for existing conditions. This CN was adjusted for antecedent moisture conditions and severity of storm by the Precipitation Zone Number methodology in the Manual – please refer to the attached annotated Figure C-1 from the Manual.

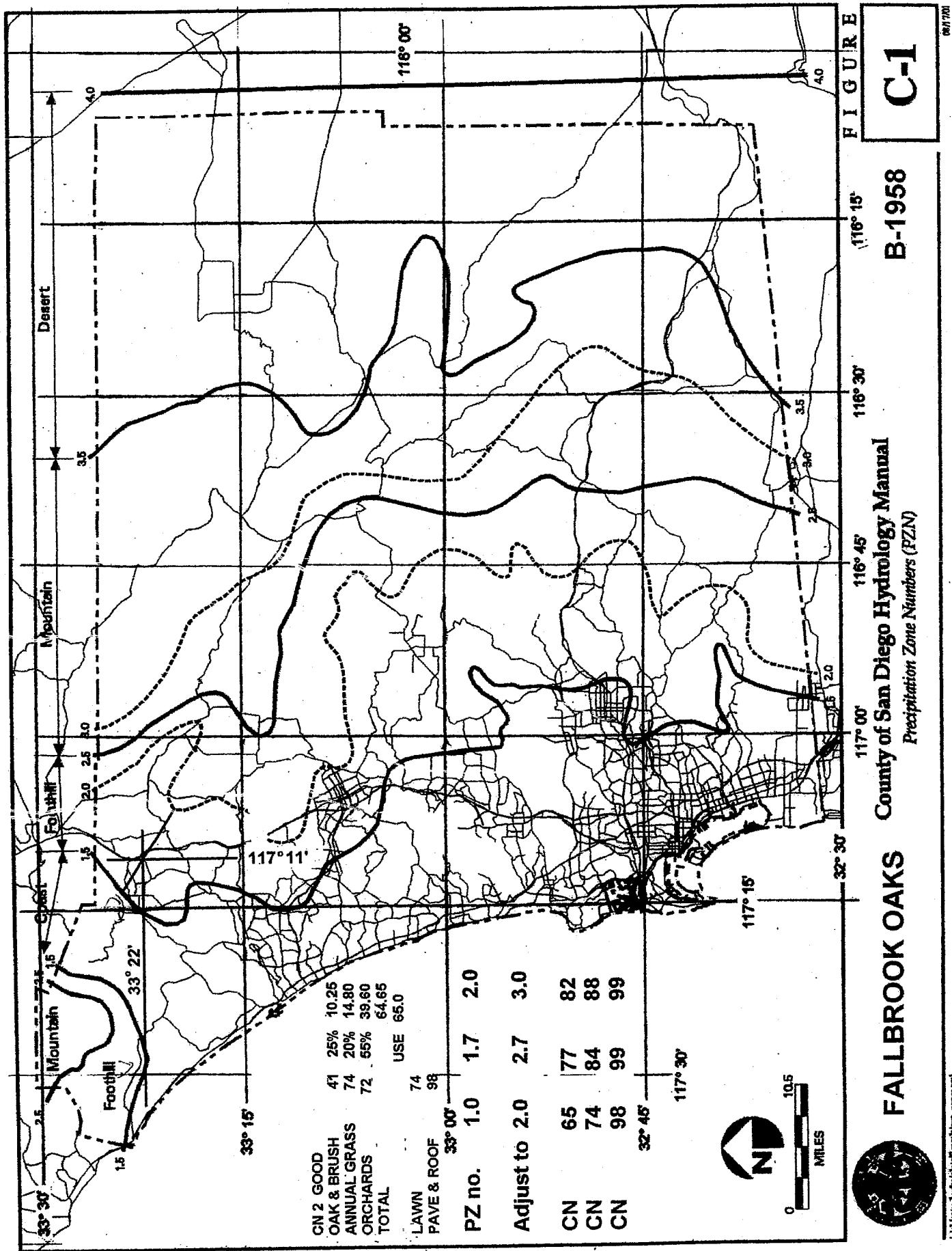
The ultimate Curve Numbers used in the NCRS are summarized below in Table 6.

Table 6 - Summary of Hydrologic Curve Numbers

<u>Cover description</u>	<u>CN</u>	<u>Notes</u>
Existing conditions	77	existing conditions onsite and offsite, pre- and post-development
Grass, landscaped	84	developed on-site vegetated conditions
Impervious areas	99	developed on-site pavement Pre-and post-development

WINTON ENGINEERING INC.

11 September 2007



FALLBROOK OAKS

County of San Diego Hydrology Manual
Precipitation Zone Numbers (PZN)

C-1
B-1958



2.5 Capacity Calculations for Reche Road Culverts

Using Chart 6B from Manual, variables are:

Diameter of culvert (inches)

Length of culvert (feet)

Head "H" (feet)

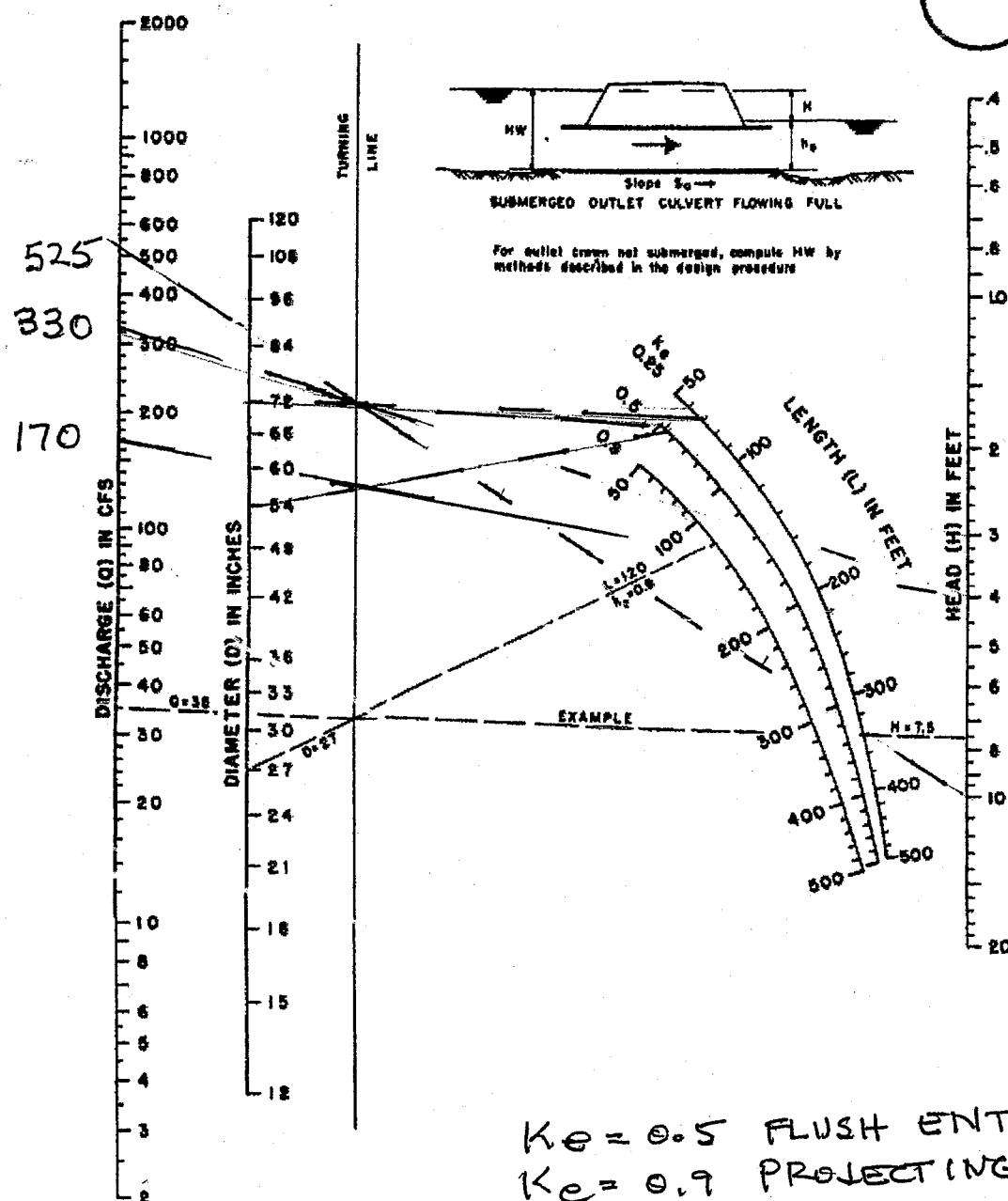
Entrance coefficient K_e .

Calculations assume headwalls on upstream end (ie, flush), in an improved (developed) condition ($K_e=0.5$)

Table 7 – Capacity of Culverts

Canyon	Size (in.)	L (ft)	H (ft)	Capacity (cfs)
Eastern	54	54	4.0	170
Central	72	50	4.0	330
Western	72	70	10.0	525
Total	-	-	-	1,025

CHART 6B



$K_e = 0.5$ FLUSH ENTRANCE
 $K_e = 0.7$ PROJECTING ENTRANCE

HEAD FOR
 STANDARD
 C. M. PIPE CULVERTS
 FLOWING FULL
 $n = 0.024$

BUREAU OF PUBLIC ROADS JAN. 1963

2.6 Hydraulic calculations for Valley Oaks Boulevard

The attached drainage calculations, based upon the project hydrology study, show that the proposed type F inlets, pipes, and grassy swales adequately capture and convey the 100-year storm runoff in Valley Oaks Boulevard.

Pipe discharge velocity is calculated, and a D-41 energy dissipator and riprap size are specified.

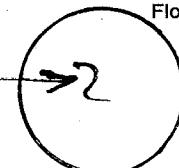
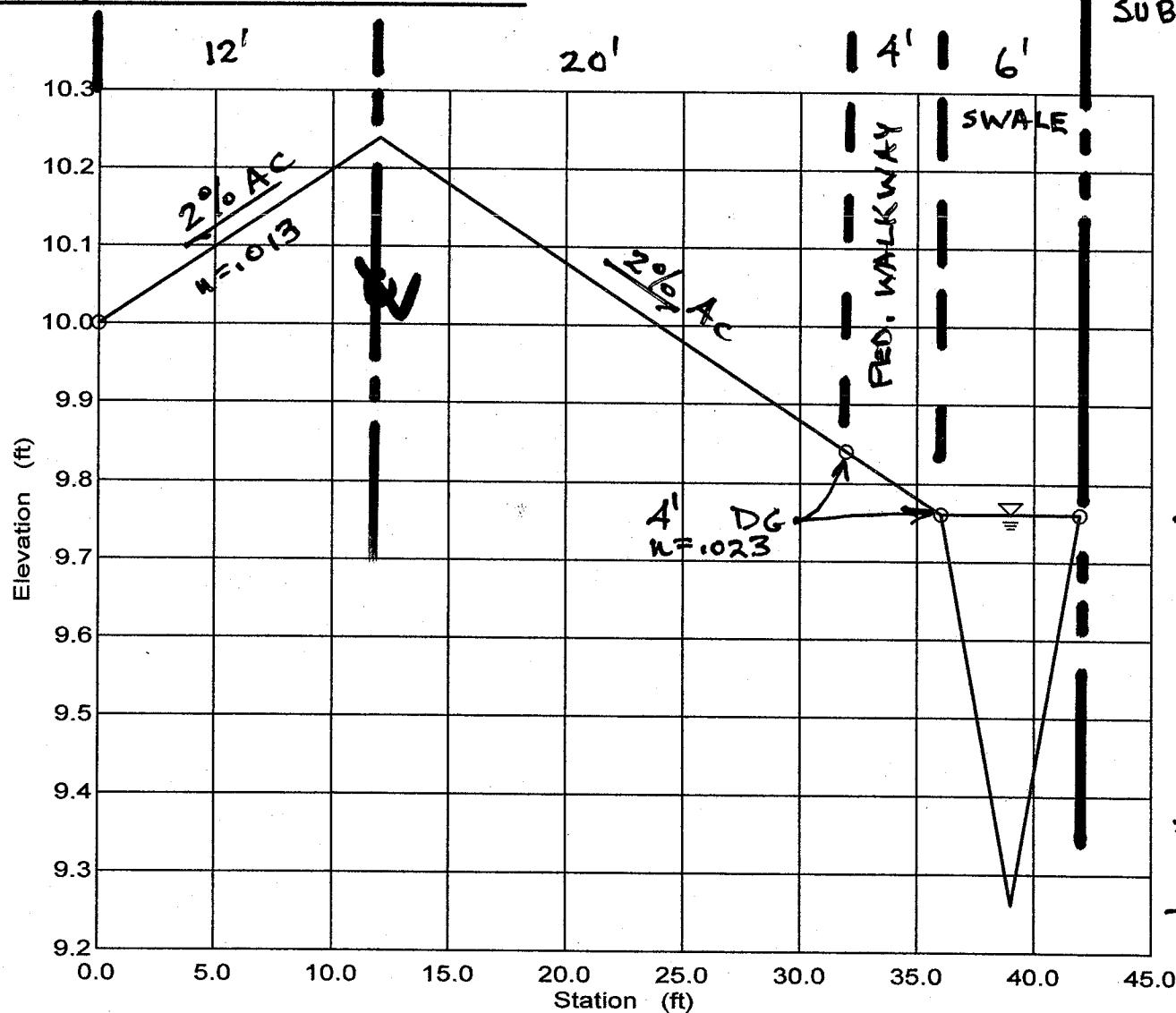
Cross Section
Cross Section for Irregular Channel

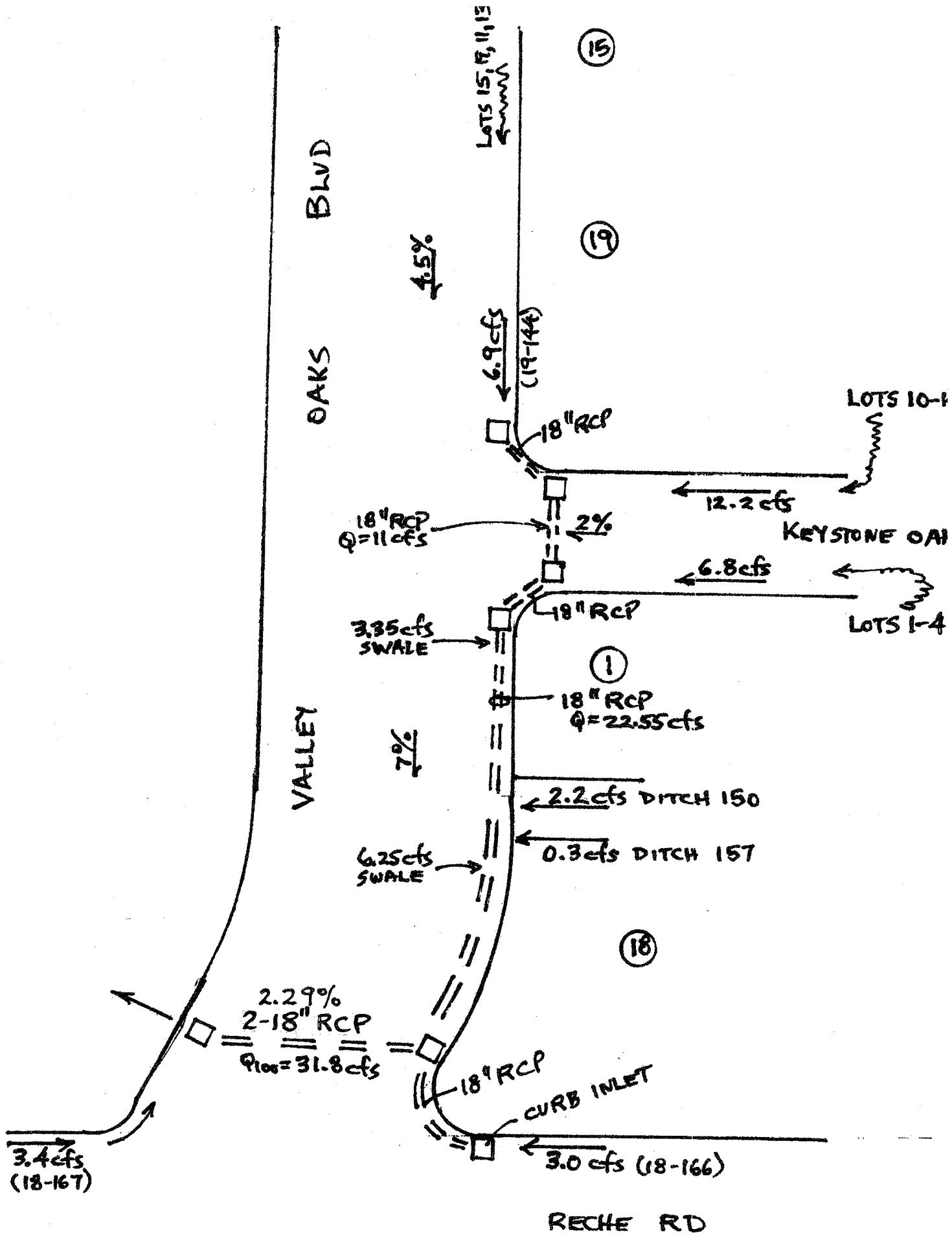
Project Description

Project File	c:\flowmaster\flowmaster\fallbron fm2
Worksheet	Valley Oaks Blvd
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data

Wtd. Mannings Coefficient	0.030
Channel Slope	0.070000 ft/ft
Water Surface Elevation	9.76 ft
Discharge	7.73 cfs





HYDRAULIC CALCS - VALLEY OAKS BLVD

1. $Q_{100} = 6.9 \text{ cfs}$ VALLEY OAK @ KEYSTONE OAKS

STREET SLOPE = 6%

PER CALCULATED RATING TABLE, ROCK-LINED SWALE
CAPACITY = 7.16 cfs OK, WATER WITHIN SWALE.

2. TYPE F INLET IN SWALE CAPTURES 6.9 cfs
USE 18" PIPE (MIN. PIPE SIZE)

3. $Q_{100} = 12.2 \text{ cfs}$ IN KEYSTONE OAKS

TYPE F INLET CAPTURES 4.1 cfs PER RATING TABLE
8.1 cfs SURFACE BYPASS

A. PIPE FLOW: $6.9 \text{ cfs} + 4.1 \text{ cfs} = 11 \text{ cfs}$

PER "FEILDS HYDRAULIC CALCULATOR"
18" RCP @ 6% CONVEYS FLOW.

5. $Q_{100} = 6.8 \text{ cfs}$ IN KEYSTONE OAKS

TYPE F CAPTURES 4.1 cfs, 2.7 cfs SURFACE BYPASS

6. SURFACE BYPASS IN SWALE: $8.1 \text{ cfs} + 2.7 \text{ cfs} = 10.8 \text{ cfs}$

TYPE F ON 6.5% GRADE CAPTURES 7.45 cfs, BY PASS = 3.35 cfs

7. PIPE FLOW: $11 \text{ cfs} + 4.1 \text{ cfs} + 7.45 \text{ cfs} = 22.55 \text{ cfs}$

18" RCP @ 6% CONVEYS 22.55 cfs

8. SWALE FLOW: $\frac{26.3 \text{ cfs} (\text{HEC-1})}{-22.55} = 3.75 \text{ cfs}$

$$3.75 + 2.2 + 0.3 \text{ cfs} = 6.25 \text{ cfs}$$

SWALE CAPACITY @ 7% = 7.73 cfs OK

TYPE F INLET CAPTURES 6.25 cfs

9. PIPE FLOW: $22.55 + 6.25 + 3.0 = 31.8 \text{ cfs}$

USE 2-18" RCP TO CONVEY 31.8 cfs @ 2.29%
SEE CALCS (PAGE 6)

Table
Rating Table for Irregular Channel

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Valley Oaks Blvd
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

**SWALE CAPACITIES @
7% AT VARIOUS WATER
DEPTHS**

Constant Data

Channel Slope	0.070000 ft/ft
---------------	----------------

Input Data

	Minimum	Maximum	Increment
Water Surface Elevation	9.26	9.76	0.05 ft

Rating Table

Water Surface Elevation (ft)	Wtd. Mannings Coefficient	Discharge (cfs)	Velocity (ft/s)
9.26	0.030	0.00	0.00
9.31	0.030	0.02	1.11
9.36	0.030	0.11	1.76
9.41	0.030	0.31	2.31
9.46	0.030	0.67	2.80
9.51	0.030	1.22	3.25
9.56	0.030	1.98	3.67
9.61	0.030	2.99	4.06
9.66	0.030	4.26	4.44
9.71	0.030	5.84	4.80
→ 9.76	0.030	7.73	5.15

← USED

Table
Rating Table for Irregular Channel

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Valley Oaks Park KEYSTONE OAKS
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Constant Data

Water Surface Elevation	9.76 ft
-------------------------	---------

SWALE CAPACITIES AT
VARIOUS ROAD GRADES

Input Data

	Minimum	Maximum	Increment
Channel Slope	0.020000	0.100000	0.005000 ft/ft

Rating Table

Channel Slope (ft/ft)	Wtd. Mannings Coefficient	Discharge (cfs)	Velocity (ft/s)	
→ 0.020000	0.030	4.13	2.75	← 2% USED
0.025000	0.030	4.62	3.08	
0.030000	0.030	5.06	3.37	
0.035000	0.030	5.47	3.64	
0.040000	0.030	5.84	3.90	
0.045000	0.030	6.20	4.13	
0.050000	0.030	6.53	4.36	
0.055000	0.030	6.85	4.57	
0.060000	0.030	7.16	4.77	
0.065000	0.030	7.45	4.97	
0.070000	0.030	7.73	5.15	
0.075000	0.030	8.00	5.33	
0.080000	0.030	8.26	5.51	
0.085000	0.030	8.52	5.68	
0.090000	0.030	8.76	5.84	
0.095000	0.030	9.01	6.00	
0.100000	0.030	9.24	6.16	

Worksheet
Worksheet for Circular Channel

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Valley Oaks Discharge pipe
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data

Mannings Coefficient	0.013
Channel Slope	0.022900 ft/ft
Depth	1.50 ft
Diameter	18.00 in

Results

Discharge	15.90	cfs
Flow Area	1.77	ft ²
Wetted Perimeter	4.71	ft
Top Width	0.00	ft
Critical Depth	1.42	ft
Percent Full	100.00	
Critical Slope	0.019824 ft/ft	
Velocity	8.99	ft/s
Velocity Head	1.26	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	17.10	cfs
Full Flow Capacity	15.90	cfs
Full Flow Slope	0.022900 ft/ft	

VALLEY OAKS DISCHARGE

FULL Q₁₀₀ = 31.8 cfs

@ DISCHARGE POINT

½ Q = 15.9 cfs

2-18" RCP @ 2.29%

FLOW 31.8 cfs

← VEL = 8.99 ft/s RIP-RAP = #2 BACKING

2.7 Hydraulic calculations for Ranger Road

The attached hydraulic calculations, based upon the project hydrology study, show that the proposed grassy swale on the west side of Ranger Road, adequately captures and conveys the 100-year storm runoff.

Cross Section
Cross Section for Irregular Channel

Project Description

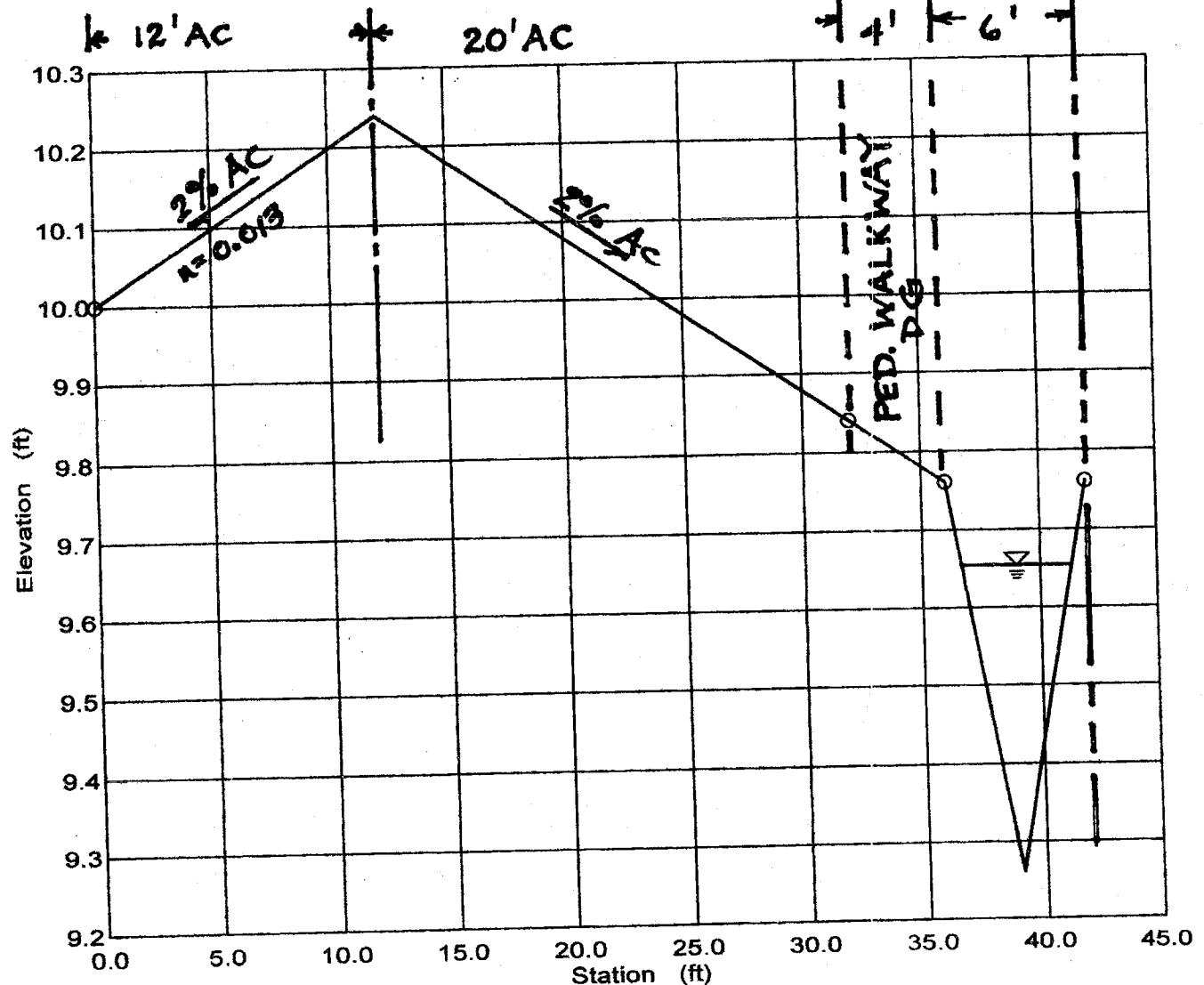
Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	valley backwater
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

RANGER ROAD

Q FROM DRAINAGE STUDY
AREA 38 = 3.31 cfs = Q₁₀₀

Section Data

Wtd. Mannings Coefficient	0.030
Channel Slope	0.046000 ft/ft
Water Surface Elevation	9.65 ft
Discharge	3.31 cfs



Worksheet
Worksheet for Irregular Channel

RANGER ROAD

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Ranger Road Drainage Swale
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data

Channel Slope	0.046000 ft/ft
Water Surface Elevation	9.65 ft

Elevation range: 9.26 ft to 10.24 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	10.00	0.00	32.00	0.013
12.00	10.24	32.00	36.00	0.023
32.00	9.84	36.00	42.00	0.030
36.00	9.76			
39.00	9.26			
42.00	9.76			

Results

Wtd. Mannings Coefficient	0.030	
Discharge	3.32 cfs	←
Flow Area	0.93 ft ²	
Wetted Perimeter	4.79 ft	
Top Width	4.73 ft	
Height	0.39 ft	
Critical Depth	9.71 ft	
Critical Slope	0.021915 ft/ft	
Velocity	3.56 ft/s	← VEL OK FOR GRASS
Velocity Head	0.20 ft	
Specific Energy	9.85 ft	
Froude Number	1.42	
Flow is supercritical.		

2.8 Hydraulic calculations for Private Storm Drain, Lot 4/5 Lot Line

The attached drainage calculations, based upon the project hydrology study, show that the proposed inlets and storm drains in Keystone Oaks Road, adequately captures and conveys the 100-year storm runoff.

Pipe discharge velocity is calculated, and a D-41 energy dissipator and riprap size are specified.

Worksheet
Worksheet for Irregular Channel

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Keystone Oaks private road
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data

Channel Slope	0.085000 ft/ft
Water Surface Elevation	9.70 ft
Elevation range: 9.18 ft to 11.18 ft.	
Station (ft)	Elevation (ft)
0.00	10.00
16.00	9.68
18.00	9.18
20.00	9.68
23.00	11.18

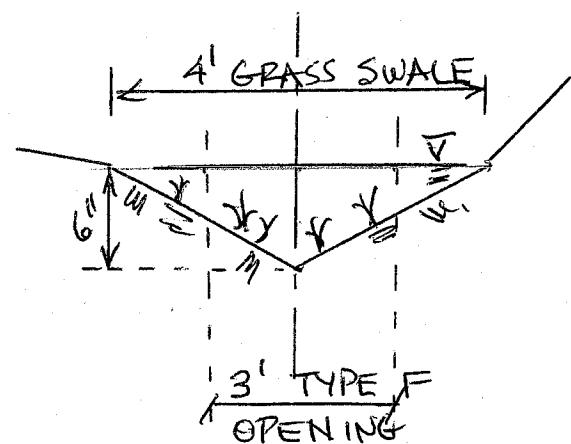
Results

Wtd. Mannings Coefficient	0.026
Discharge	6.36 cfs ←
Flow Area	1.09 ft ²
Wetted Perimeter	5.17 ft
Top Width	5.04 ft
Height	0.52 ft
Critical Depth	9.86 ft
Critical Slope	0.009682 ft/ft
Velocity	5.83 ft/s ← OK
Velocity Head	0.53 ft
Specific Energy	10.23 ft
Froude Number	2.21
Flow is supercritical.	

KEYSTONE OAKS

7/6 LOT LINE

$$Q_{100} = 6.41 \text{ cfs } @ 16:00$$



3' OPENING CAPTURES
93.75% OF FLOW.

$$6.41 \times .9375 = 6.00 \text{ cfs}$$

⇒ 3.75% → 12" RCP

$$\text{BYPASS} = 0.41 \text{ cfs}$$

Cross Section
Cross Section for Irregular Channel

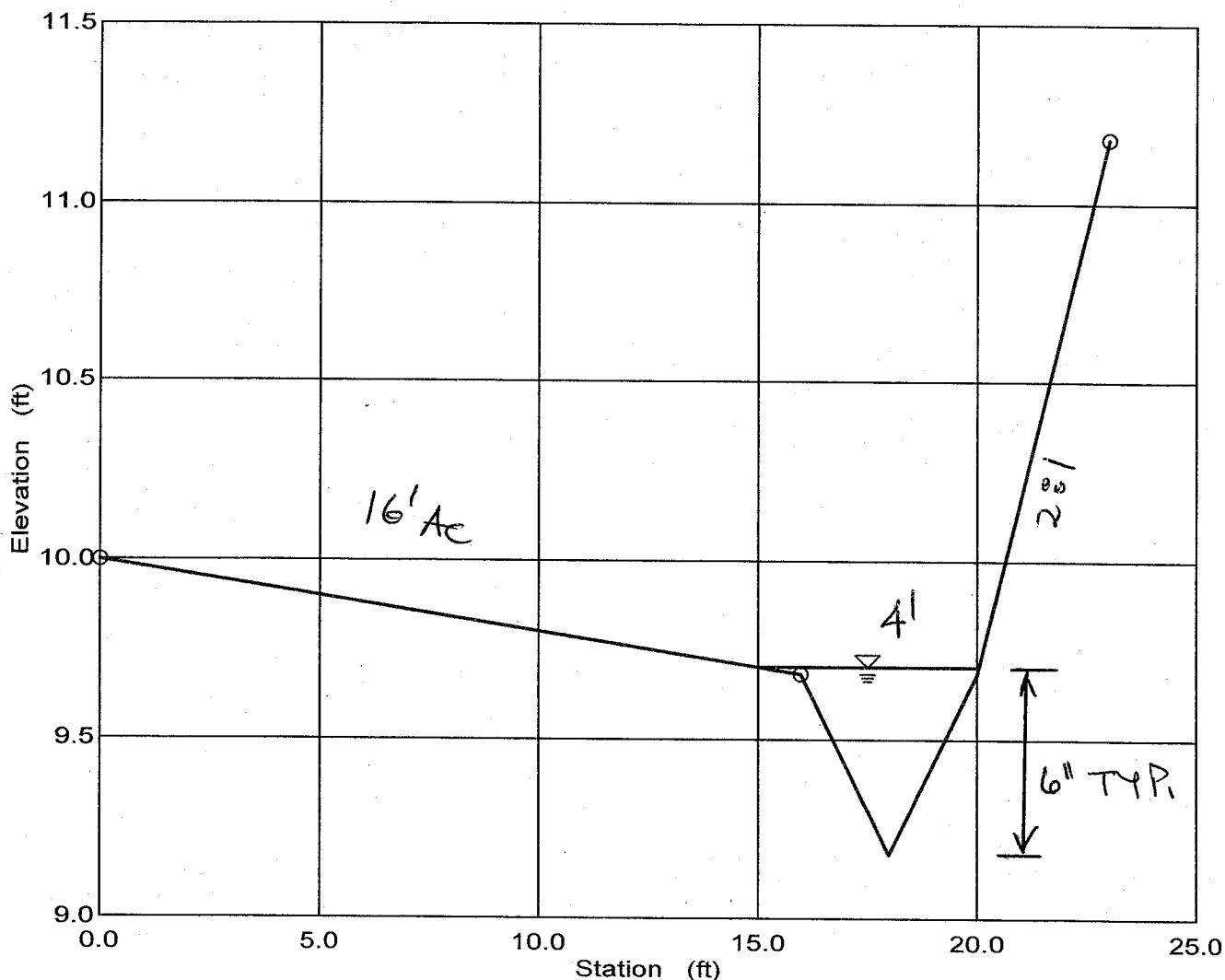
7/6 LOT LINE

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Keystone Oaks private road
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data

Wtd. Mannings Coefficient	0.026
Channel Slope	0.085000 ft/ft
Water Surface Elevation	9.70 ft
Discharge	6.36 cfs



Worksheet
Worksheet for Irregular Channel

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Keystone Oaks private road
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data

Channel Slope	0.037500 ft/ft
Water Surface Elevation	9.51 ft
Elevation range: 9.18 ft to 11.18 ft.	
Station (ft)	Elevation (ft)
0.00	10.00
16.00	9.68
18.00	9.18
20.00	9.68
23.00	11.18

Results

Wtd. Mannings Coefficient	0.030
Discharge	1.23 cfs
Flow Area	0.44 ft ²
Wetted Perimeter	2.72 ft
Top Width	2.64 ft
Height	0.33 ft
Critical Depth	0.54 ft
Critical Slope	0.024228 ft/ft
Velocity	2.83 ft/s <i>OK</i>
Velocity Head	0.12 ft
Specific Energy	9.63 ft
Froude Number	1.23

Flow is supercritical.

KEYSTONE OAKS

4/5 LOT LINE

$$Q_{100} = 7.22 \text{ cfs ("PIPE 1") @ 16:00}$$

$$- 6.00 \text{ cfs INTERCEPTED}$$

$$\underline{1.22 \text{ cfs}}$$

100% CAPTURE IN
FINLET

Cross Section
Cross Section for Irregular Channel

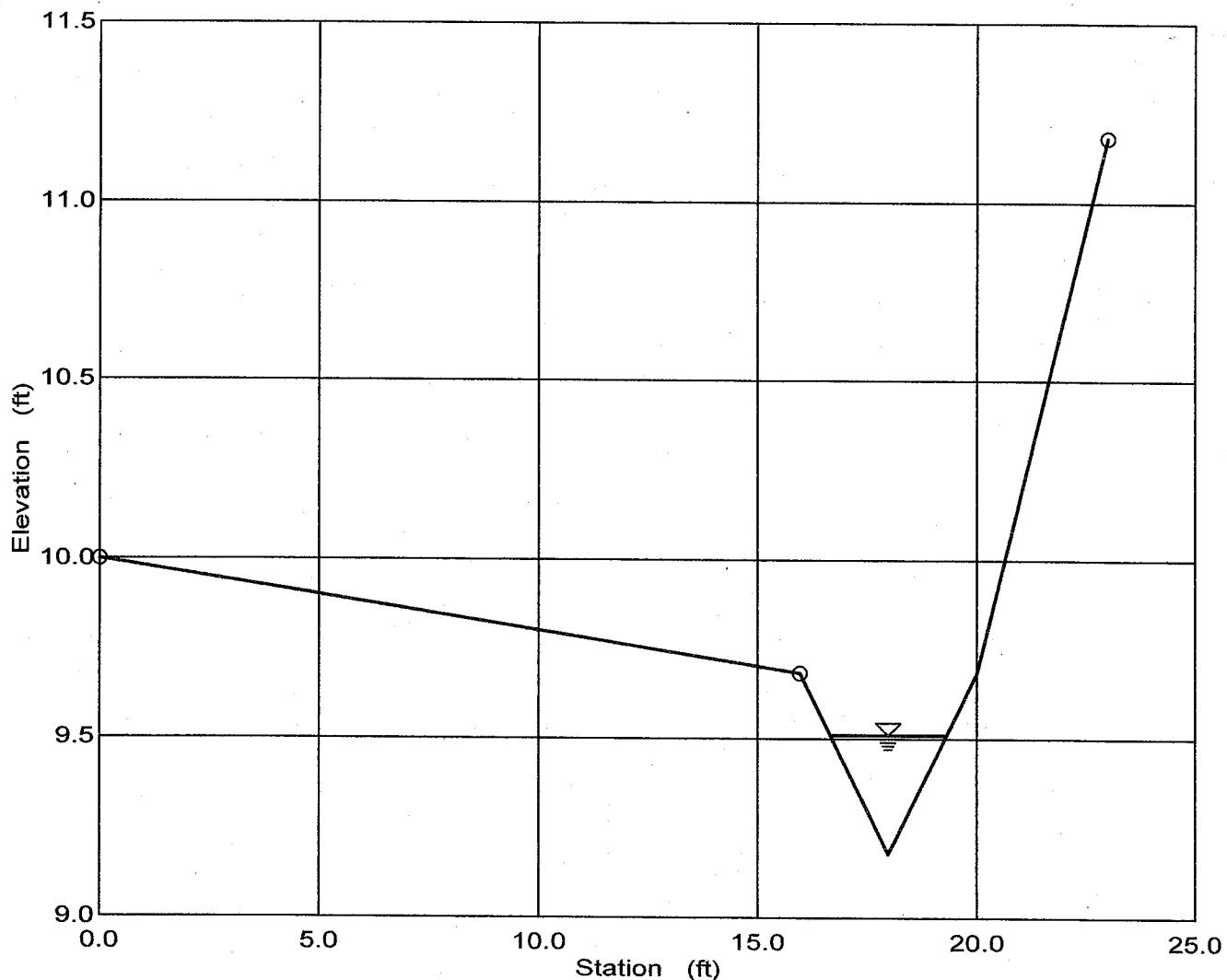
Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Keystone Oaks private road
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

4/5 LOT LINE

Section Data

Wtd. Mannings Coefficient	0.030
Channel Slope	0.037500 ft/ft
Water Surface Elevation	9.51 ft
Discharge	1.23 cfs



Worksheet
Worksheet for Circular Channel

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Lot 5 / 6 private stormdrain
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

KEYSTONE OAKS

18" RCP @ 0.6%

7.22 cfs

Input Data

Mannings Coefficient	0.013
Channel Slope	0.006000 ft/ft
Depth	1.10 ft
Diameter	18.00 in

Results

Discharge	7.22	cfs
Flow Area	1.39	ft ²
Wetted Perimeter	3.08	ft
Top Width	1.33	ft
Critical Depth	1.04	ft
Percent Full	73.33	
Critical Slope	0.006902	ft/ft
Velocity	5.20	ft/s
Velocity Head	0.42	ft
Specific Energy	1.52	ft
Froude Number	0.90	
Maximum Discharge	8.75	cfs
Full Flow Capacity	8.14	cfs
Full Flow Slope	0.004730	ft/ft
Flow is subcritical.		

Worksheet
Worksheet for Circular Channel

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Lot 5 / 6 private stormdrain
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

KEYSTONE OAKS

18" RCP @ 2%

Q = 7.22 cfs

Input Data

Mannings Coefficient	0.013
Channel Slope	0.100000 ft/ft
Depth	0.48 ft
Diameter	18.00 in

Results

Discharge	7.37 cfs
Flow Area	0.49 ft ²
Wetted Perimeter	1.80 ft
Top Width	1.40 ft
Critical Depth	1.05 ft
Percent Full	32.00
Critical Slope	0.006992 ft/ft
Velocity	15.11 ft/s
Velocity Head	3.55 ft
Specific Energy	4.03 ft
Froude Number	4.51
Maximum Discharge	35.73 cfs
Full Flow Capacity	33.22 cfs
Full Flow Slope	0.004918 ft/ft
Flow is supercritical.	

$v = 15 \text{ ft/s}$

CONCLUSION:

CONSTRUCT D-41

ENERGY DISSIPATOR.

USE 1 TON RIPRAP
PER TABLE 5-2 (7-1)
DRAINAGE DESIGN
MANUAL

2.9 Hydrology and Hydraulic Calculations for Brow Ditches

The attached hydraulic calculations show that the proposed rock-lined brow ditches, adequately capture and convey the 100-year storm runoff.

Discharge velocity is calculated, and no riprap is necessary.

Hydrology- West brow ditch.

There is a paved grove road, north of the northerly boundary of the project. According to the contours on the project topographic map, this grove road intercepts the runoff from the adjoining grove. Therefore, the subject onsite brow ditch collects water from a 15-foot wide strip of land. On the west portion, that totals about 0.1 acre. This area is a portion of Area 12 of the "West Canyon" (developed) in the hydrology study.

<u>Location</u>	<u>Hydrol. ID</u>	<u>Drainage Area (sq mi.)</u>	<u>Drainage Area (ac)</u>	<u>Peak Flow (cfs)</u>	<u>Time to Peak Flow (hr:min)</u>	<u>Time to Peak Flow (cfs/ac)</u>
West Canyon	12	0.26736	171.1	542.44	16:00	3.17

$$3.17 \text{ cfs/ac} \times 0.1 \text{ ac} = \mathbf{0.32 \text{ cfs}}$$

Hydrology- East brow ditch.

There is a paved grove road, north of the northerly boundary of the project. According to the contours on the project topographic map, this grove road intercepts the runoff from the adjoining grove. Therefore, the subject onsite brow ditch collects water from a 15-foot wide strip of land. On the east portion, that totals about 0.2 acre. This area is a portion of Area 22 of the "Center Canyon" in the hydrology study.

<u>Location</u>	<u>Hydrol. ID</u>	<u>Drainage Area (sq mi.)</u>	<u>Drainage Area (ac)</u>	<u>Peak Flow (cfs)</u>	<u>Time to Peak Flow (hr:min)</u>	<u>Time to Peak Flow (cfs/ac)</u>
Cntr Canyon	22	0.39573	253.3	822.1	16:05	3.25

$$3.25 \text{ cfs/ac} \times 0.2 \text{ ac} = \mathbf{0.65 \text{ cfs}}$$

Worksheet
Worksheet for Triangular Channel

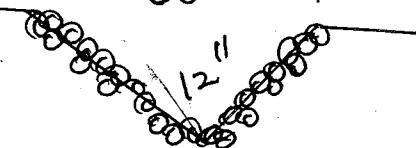
Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Brow ditch along Norther Boundary
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Discharge

WEST BROW DITCH

$$Q_{100} = 0.32 \text{ cfs}$$

30"



ROCK-LINED D-75A
EARTH DITCH

Input Data

Mannings Coefficient	0.035
Channel Slope	0.035000 ft/ft
Depth	0.35 ft
Left Side Slope	1.250000 H : V
Right Side Slope	1.250000 H : V

Results

Discharge	0.32	cfs	←
Flow Area	0.15	ft ²	
Wetted Perimeter	1.12	ft	
Top Width	0.88	ft	
Critical Depth	0.33	ft	
Critical Slope	0.045092	ft/ft	
Velocity	2.11	ft/s	← NO RIP RAP AT DISCHARGE PT.
Velocity Head	0.07	ft	
Specific Energy	0.42	ft	
Froude Number	0.89		
Flow is subcritical.			

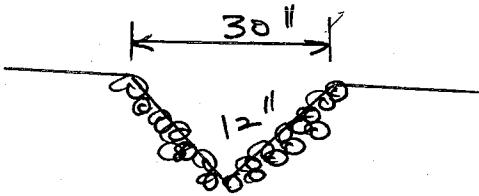
Worksheet
Worksheet for Triangular Channel

Project Description

Project File	c:\flowmaster\flowmaster\fallbroo.fm2
Worksheet	Brow ditch along Norther Boundary
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Discharge

EAST BROW DITCH

$$Q_{100} = 0.65 \text{ cfs}$$



ROCK-LINED D-75A
EARTH DITCH

Input Data

Mannings Coefficient	0.035
Channel Slope	0.064000 ft/ft
Depth	0.41 ft
Left Side Slope	1.250000 H : V
Right Side Slope	1.250000 H : V

Results

Discharge	0.65	cfs	←
Flow Area	0.21	ft ²	←
Wetted Perimeter	1.30	ft	
Top Width	1.02	ft	
Critical Depth	0.44	ft	
Critical Slope	0.041052	ft/ft	
Velocity	3.15	ft/s	
Velocity Head	0.15	ft	
Specific Energy	0.56	ft	
Froude Number	1.23		
Flow is supercritical.			

NO RIPRAP AT DISCHARGE POINT

Chapter 3 – Determination of 100-year Flood Lines of Inundation

CHAPTER 3 - Determination of 100-year Flood Lines of Inundation

For this report, the US Army Corps of Engineers hydraulic program, HEC-RAS River Analysis System (latest Version 4.0, November 2006) was used to model the 100-year storm running through the natural drainage courses onsite. The project proposes no changes to, or modifications of, these natural drainage courses.

As requested, the cross-sections used in the calculations were taken at 25-foot intervals, are numbered sequentially, and are shown on the map of Lines of Inundation (Chapter 14). Note that there is no cross-section 17 in the Center Canyon.

From Table A-5 of Appendix A of the SD County Drainage Design Manual, a Manning's n value of 0.030 was chosen as appropriate for these natural drainage courses.

An important fact that emerged from this study is that the 100-year flood in the East Canyon, overflows 253 cfs into the Center Canyon at one location just north of the former building site. The overflow is calculated by the HEC-RAS program by a standard weir method.

This is an existing condition without any contribution from the proposed development. The area of the overflow is within the biological open space area, and therefore no construction or grading is proposed to change this existing condition.

Because of the overflow from the East Canyon to the Center Canyon, this report will identify the tabulated calculation summaries which are based solely upon the hydrology study as "Hydrology", and those that are modified by the results of the hydraulic calculations, "Hydraulic".

The hydraulic calculations in Chapters 10 and 11 state "After Development" because that was the basis used. However, the Pre-Development and Post-Development Qs are almost equivalent, so that the calculated flood inundation lines are essentially valid for the existing pre-development conditions as well.

Table I - 100-Year Developed Conditions (Hydraulic)

<u>Canyon</u>	<u>Drainage Area (Ac)</u>	<u>Peak Flow (cfs)</u>	<u>Over Flow (cfs)</u>	<u>Peak Flow (cfs)</u>	<u>Time to Peak Flow (hr:min)</u>	<u>Pipe Size (in.)</u>	<u>Pipe Capacity (cfs)</u>
Eastern	138.5	458.7	-253	205.7	16:00	54	170
Central	264.1	803.7	+253	1056.7	16:05	72	330
Western	281.3	853.8	-	860.5	16:05	72	525
Total	683.9	2,116.2	-	2,116.2	-	-	1,025

Table II - Summary of 100-Year Existing Conditions (Hydraulic)

<u>Canyon</u>	<u>Drainage Area</u>	<u>Peak Flow</u>	<u>Over Flow</u>	<u>Peak Flow</u>	<u>Time to Peak Flow</u>	<u>Pipe Size</u>	<u>Pipe Capacity</u>
	(Ac)	(cfs)	(cfs)	(cfs)	(hr:min)	(in.)	(cfs)
Eastern	138.5	466.8	-253	213.8	16:00	54	170
Central	264.1	803.8	+253	1056.8	16:05	72	330
Western	281.3	860.5	-	860.5	16:05	72	525
Total	683.9	2,131.1	---	2,131.1	-	-	1,025

Flow values in the HEC-RAS hydraulic runs vary slightly (due primarily to rounding) from the hydrology (HEC-HMS) values, but the differences are extremely minor and inconsequential. The HEC-RAS results accurately reflect site conditions.

Table III - Comparison of 100-Year Developed Conditions (Hydraulic)

<u>Canyon</u>	<u>value source</u>	<u>location</u>	<u>Peak Flow</u>	<u>Over Flow</u>	<u>Peak Flow</u>
			(cfs)	(cfs)	(cfs)
Eastern	Table I/ HEC-HMS	D	458.7	(253)	205.7
Eastern	HEC-RAS	D	459	-253	206

Table IV - Comparison of 100-Year Developed Conditions (Hydraulic)

<u>Canyon</u>	<u>value source</u>	<u>location</u>	<u>Peak Flow</u>	<u>Over Flow</u>	<u>Peak Flow</u>
			(cfs)	(cfs)	(cfs)
Central	Table I/ HEC-HMS	G	803.7	+253	1056.7
Central	HEC-RAS	G	799	+253	1052

HEC-RAS also calculated pipe capacities at Reche Road, albeit for slightly different conditions than reflected in Section 2.5. The results confirm that the Reche Road pipe culverts are undersized.

Table V - HEC-RAS Pipe Capacities at Reche Road (Hydraulic)

<u>Canyon</u>	<u>value source</u>	<u>location</u>	<u>Peak Flow</u>	<u>Pipe Size</u>	<u>Pipe Capacity</u>
			(cfs)	(in.)	(cfs)
Eastern	HEC-RAS	D	206	54	124
Central	HEC-RAS	G	1052	72	330

Chapter 4 – Results for Existing Conditions – East Canyon

Project: COE 6-24 EAST CANYON BEFORE DEVELOPMENT

Start of Run:	01 Jan 2000 00:00	Basin Model:	Basin 1
End of Run:	02 Jan 2000 00:00	Meteorolic Model:	Met 1
Compute Time	13 Dec 2007 12:42:41	Control Specifications:	Control 1

BEFORE DEVELOPMENT Junction D 138.6 ac. 466.8 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Junction A	0.07169	189.974	01Jan2000, 16:00	3.04
Junction B	0.15085	347.259	01Jan2000, 16:00	3.02
Junction C	0.19816	429.191	01Jan2000, 16:00	3.02
Junction D	0.21659	466.824	01Jan2000, 16:00	3.04
Junction E	0.01427	23.123	01Jan2000, 16:05	3.21
Sub 10	0.00410	16.018	01Jan2000, 16:00	3.05
Sub 11	0.01774	43.963	01Jan2000, 16:00	3.01
Sub 12	0.02750	71.493	01Jan2000, 16:00	3.02
Sub 13	0.03717	97.674	01Jan2000, 16:00	3.02
Sub 14	0.04786	122.205	01Jan2000, 16:00	3.03
Sub 15	0.05473	131.666	01Jan2000, 16:00	3.03
Sub 16	0.08674	218.168	01Jan2000, 16:00	3.03
Sub 17	0.10231	233.980	01Jan2000, 16:00	3.03
Sub 18	0.16473	359.183	01Jan2000, 16:00	3.02
Sub 19	0.17063	360.496	01Jan2000, 16:00	3.03
Sub 20	0.00402	14.914	01Jan2000, 16:00	3.04
Sub 21	0.00174	6.573	01Jan2000, 16:00	3.04
Sub 22	0.00488	19.190	01Jan2000, 16:00	3.06
Sub 23	0.00813	31.013	01Jan2000, 16:00	3.06
Sub 24	0.01273	45.678	01Jan2000, 16:00	3.06
Sub 25	0.01696	58.309	01Jan2000, 16:00	3.07
Sub 26	0.00162	6.134	01Jan2000, 16:00	3.04
Sub 27	0.00562	22.004	01Jan2000, 16:00	3.05
Sub 28	0.01348	50.652	01Jan2000, 16:00	3.05
Sub 29	0.02678	74.316	01Jan2000, 16:00	3.04
Sub 30	0.04854	113.279	01Jan2000, 16:00	3.01
Sub 31	0.00814	28.834	01Jan2000, 16:00	3.04
Sub 32	0.01469	46.627	01Jan2000, 16:00	3.04
Sub 33	0.02753	68.695	01Jan2000, 16:00	3.02
Sub 34	0.01238	19.235	01Jan2000, 16:05	2.95
Sub 35	0.00096	3.783	01Jan2000, 16:00	5.35
Sub 36	0.01441	23.226	01Jan2000, 16:05	3.24

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BEFORE DEVELOPMENT Junction D 138.6 ac. 466.8 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Sub 37	0.00023	0.849	01Jan2000, 16:00	4.52
Sub 38	0.00093	4.243	01Jan2000, 16:00	4.55

FALLBROOK OAKS
EAST CANYON BEFORE

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WINTON ENGINEERING INC.

HEC-HMS DATA

SCALE 1in. = 180 ft.

**EAST CANYON RED
BEFORE DEVELOPMENT**

SUB 20 ONLY 1" = 100 ft.

SUB. 10

	sq. in.	% sq. mi.	CN _{2.7}	Imp	Length	Slope	n	Bottom	Side slope	Shape
plane 1	1.76	50%	77.0	360	0.190	0.13				
plane 2	1.77	50%	77.0	160	0.350	0.13				
channel				585	0.170	0.03	3	0.25	T	
total	3.53		0.00410							
			2.62508 ac.							

SUB.11

	sq. in.	% sq. mi.	CN _{2.7}	Imp	Length	Slope	n	Bottom	Side slope	Shape
plane 1	10.00	85%	77.0	900	0.150	0.13				
plane 2	1.74	15%	77.0	150	0.110	0.13				
channel				440	0.140	0.03	3	0.25	T	
total	11.74		0.01364							
			8.73043 ac.							

SUB.12

	sq. in.	% sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	5.10	61%	77.0	540	0.240	0.13			
plane 2	3.30	39%	77.0	270	0.280	0.13			
channel				450	0.070	0.03	3	0.25	T
total	8.40		0.00976						
			6.24664 ac.						

SUB. 13

	sq. in.	% sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	6.00	72%	77.0	410	0.300	0.13			
plane 2	2.32	28%	77.0	225	0.350	0.13			
channel				650	0.070	0.03	3	0.25	T
total	8.32		0.00967						
			6.18715 ac.						

SUB. 14

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	6.60	72%	77.0	490	0.250	0.13			
plane 2	2.60	28%	77.0	150	0.350	0.13			
channel				560	0.040	0.03	3	0.25	T
total	9.20		0.01069						
			6.84156 ac.						

SUB 15

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.85	65%	77.0	650	0.190	0.13			
plane 2	2.06	35%	77.0	180	0.170	0.13			
channel				620	0.090	0.03	3	0.25	T
total	5.91		0.00687						
			4.39496 ac.						

FALLBROOK OAKS
EAST CANYON BEFORE

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WINTON ENGINEERING INC.

Junction A

SUB 16

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	11.07	85%	77.0	1280	0.150	0.13			
plane 2	1.88	15%		380	0.140	0.13			
channel				240	0.060	0.03	3	0.25	T
total	12.95		0.01505						
			9.63024 ac.						

SUB 17

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	6.03	45%	77.0	720	0.09	0.13			
plane 2	7.37	55%	77.0	400	0.140	0.13			
channel				610	0.070	0.03	3	0.25	T
total	13.40		0.01557						
			9.96488 ac.						

Junction B

SUB. 18

	A sq. ft.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.50	21%	77.0	110	0.180	0.13			
plane 2	9.44	79%	77.0	630	0.120	0.13			
channel				740	0.030	0.03	3	0.25	T
total	11.94		0.01388						
			8.87916 ac.						

SUB. 19

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.18	23%	77.0	90	0.110	0.13			
plane 2	3.90	77%	77.0	360	0.050	0.13			
channel				450	0.040	0.03	3	0.25	T
total	5.08		0.00590						
			3.77773 ac.						

Junction C

SUB.20

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.75	33%	77.0	70	0.170	0.13			
plane 2	7.46	67%	77.0	317	0.120	0.13			
channel				375	0.010	0.03	3	0.25	T
total	11.21		0.00402						
			2.57293 ac.						

Junction D

SUB.21

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	0.73	49%	77.0	270	0.150	0.13			
plane 2	0.77	51%	77.0	140	0.250	0.13			
channel				270	0.150	0.03	3	0.25	T
total	1.50		0.00174						
			1.11547 ac.						

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SUB.22

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.20	44%		77.0	160	0.250	0.13		
plane 2	1.50	56%		77.0	250	0.260	0.13		
channel					215	0.120	0.03	3	0.25 T
total	2.70		0.00314						
			2.00785 ac.						

SUB.23

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.50	54%		77.0	180	0.190	0.13		
plane 2	1.30	46%		77.0	140	0.170	0.13		
channel					290	0.100	0.03	3	0.25 T
total	2.80		0.00325						
			2.08221 ac.						

SUB.24

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.46	62%		77.0	210	0.170	0.13		
plane 2	1.50	38%		77.0	90	0.170	0.13		
channel					490	0.080	0.03	3	0.25 T
total	3.96		0.00460						
			2.94485 ac.						

SUB.25

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.64	45%		77.0	150	0.200	0.13		
plane 2	2.00	55%		77.0	160	0.310	0.13		
channel					640	0.130	0.03	3	0.25 T
total	3.64		0.00423						
			2.70688 ac.						

Junction A

SUB.26

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	0.47	34%		77.0	320	0.230	0.13		
plane 2	0.92	66%		77.0	125	0.240	0.13		
channel					320	0.230	0.03	3	0.25 T
total	1.39		0.00162						
			1.03367 ac.						

SUB.27

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.04	30%		77.0	90	0.220	0.13		
plane 2	2.40	70%		77.0	180	0.280	0.13		
channel					410	0.130	0.03	0	0.03 T
total	3.44		0.00400						
			2.55815 ac.						

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SUB. 28

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.00	44%		77.0	180	0.290	0.13		
plane 2	3.76	56%		77.0	300	0.200	0.13		
channel					525	0.090	0.03	3	0.25 T
total	6.76		0.00786						
			5.02706 ac.						

SUB. 29

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.52	31%		77.0	500	0.130	0.13		
plane 2	7.92	69%		77.0	630	0.110	0.13		
channel					495	0.060	0.03	3	0.25 T
total	11.44		0.01330						
			8.50733 ac.						

SUB.30

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	4.06	22%		77.0	470	0.140	0.13		
plane 2	14.66	78%		77.0	1000	0.100	0.13		
channel					420	0.130	0.03	3	0.25 T
total	18.72		0.02176						
			13.9211 ac.						

Junction B

SUB.31

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.56	37%		77.0	250	0.220	0.13		
plane 2	4.44	63%		77.0	360	0.150	0.13		
channel					630	0.170	0.03	3	0.25 T
total	7.00		0.00814						
			5.20554 ac.						

SUB.32

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.60	46%		77.0	360	0.150	0.13		
plane 2	3.04	54%		77.0	310	0.190	0.13		
channel					590	0.090	0.03	3	0.25 T
total	5.64		0.00655						
			4.19417 ac.						

SUB.33

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	9.80	89%		77.0	770	0.140	0.13		
plane 2	1.25	11%		77.0	360	0.170	0.13		
channel					540	0.080	0.03	3	0.25 T
total	11.05		0.01284						
			8.21731 ac.						

FALLBROOK OAKS
EAST CANYON BEFORE

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WINTON ENGINEERING INC.

SUB.34

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	10.65	100%	77.0	1400 0.140	0.13			
plane 2								
channel				1350 0.100	0.03	3	0.25	T
total	10.65		0.01238					
			7.91985 ac.					

SUB.35

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.75	100%	99.0	27 0.057	0.13			
plane 2								
channel				1350 0.050	0.05		0.25	t
total	0.75		0.00087					
			0.55774 ac.					

SUB.36

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.12	100%	99.0	54 0.057	0.1			
plane 2								
channel				100 0.05	0.05		0.25	t
total	0.12		0.00014					
			0.08924 ac.					

SUB.37

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.10	50%	99.0	102 0.100	0.1			
plane 2	0.10	50%	84.0	5 0.200	0.05			
channel				226 0.100	0.05		0.25	t
total	0.20		0.00023					
			0.14873 ac.					

SUB.38

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.30	50%	99.0	102 0.100	0.1			
plane 2	0.30	50%	94.0	5 0.200	0.05			
channel				500 0.100	0.05		0.25	t
total	0.60		0.00070					
			0.44619 ac.					

Chapter 5 – Results for Developed Conditions – East Canyon

Project: COE 6-24 EAST CANYON AFTER DEVELOPMENT

Start of Run: 01 Jan 2000 00:00 Basin Model: Basin 1
End of Run: 02 Jan 2000 00:00 Meteorolic Model: Met 1
Compute Time 13 Dec 2007 12:17:34 Control Specifications: Control 1

AFTER DEVELOPMENT Junction D 138.6 ac. 458.7 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Junction 1	0.00010	0.298	01Jan2000, 16:00	4.34
Junction 2	0.00025	0.500	01Jan2000, 16:00	4.31
Junction 3	0.00006	0.269	01Jan2000, 16:00	4.54
Junction 4	0.00019	0.368	01Jan2000, 16:00	4.49
Junction A	0.07169	189.974	01Jan2000, 16:00	3.04
Junction B	0.15085	347.259	01Jan2000, 16:00	3.02
Junction C	0.19816	429.191	01Jan2000, 16:00	3.02
Junction D	0.21524	458.656	01Jan2000, 16:00	3.04
Junction E	0.01334	21.830	01Jan2000, 16:05	3.12
Junction F	0.00071	2.490	01Jan2000, 16:00	4.41
Junction G	0.00072	2.542	01Jan2000, 16:00	4.41
Junction H	0.00111	2.847	01Jan2000, 16:00	4.32
Junction I	0.00115	2.843	01Jan2000, 16:00	4.35
LOT 16- 39	0.00006	0.101	01Jan2000, 16:05	3.66
LOT 16- 40	0.00004	0.220	01Jan2000, 16:00	5.37
LOT 16- 41	0.00011	0.244	01Jan2000, 16:00	4.28
LOT 16- 42	0.00016	0.307	01Jan2000, 16:10	4.15
LOT 16- 43	0.00020	0.314	01Jan2000, 16:15	4.04
LOT 16- 44	0.00005	0.275	01Jan2000, 16:00	5.37
LOT 16- 45	0.00028	0.460	01Jan2000, 16:00	4.23
LOT 16- 46	0.00004	0.090	01Jan2000, 16:05	3.67
LOT 16- 47	0.00039	1.968	01Jan2000, 16:00	4.61
LOT 17- 48	0.00001	0.052	01Jan2000, 16:00	4.82
LOT 17- 49	0.00003	0.106	01Jan2000, 16:00	3.70
LOT 17- 50	0.00003	0.163	01Jan2000, 16:00	5.37
LOT 17- 51	0.00010	0.308	01Jan2000, 16:05	4.39
LOT 17- 52	0.00014	0.292	01Jan2000, 16:20	4.18
LOT 17- 53	0.00005	0.273	01Jan2000, 16:00	5.37
LOT 17- 54	0.00034	0.571	01Jan2000, 16:10	4.12
LOT 17- 55	0.00037	0.568	01Jan2000, 16:15	4.08
lot 17- 56	0.00003	0.163	01Jan2000, 16:00	5.37
lot 17- 57	0.00074	2.625	01Jan2000, 16:00	4.44

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AFTER DEVELOPMENT Junction D 138.6 ac. 458.7 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
lot 17- 58	0.00112	2.680	01Jan2000, 16:00	4.33
lot 17- 59	0.00116	2.808	01Jan2000, 16:00	4.36
Sub 10	0.00410	16.018	01Jan2000, 16:00	3.05
Sub 11	0.01774	43.963	01Jan2000, 16:00	3.01
Sub 12	0.02750	71.493	01Jan2000, 16:00	3.02
Sub 13	0.03717	97.674	01Jan2000, 16:00	3.02
Sub 14	0.04786	122.205	01Jan2000, 16:00	3.03
Sub 15	0.05473	131.666	01Jan2000, 16:00	3.03
Sub 16	0.08674	218.168	01Jan2000, 16:00	3.03
Sub 17	0.10231	233.980	01Jan2000, 16:00	3.03
Sub 18	0.16473	359.183	01Jan2000, 16:00	3.02
Sub 19	0.17063	360.496	01Jan2000, 16:00	3.03
Sub 20	0.00232	5.444	01Jan2000, 16:00	2.98
Sub 21	0.00174	6.573	01Jan2000, 16:00	3.04
Sub 22	0.00488	19.190	01Jan2000, 16:00	3.06
Sub 23	0.00813	31.013	01Jan2000, 16:00	3.06
Sub 24	0.01273	45.678	01Jan2000, 16:00	3.06
Sub 25	0.01696	58.309	01Jan2000, 16:00	3.07
Sub 26	0.00162	6.134	01Jan2000, 16:00	3.04
Sub 27	0.00562	22.004	01Jan2000, 16:00	3.05
Sub 28	0.01348	50.652	01Jan2000, 16:00	3.05
Sub 29	0.02678	74.316	01Jan2000, 16:00	3.04
Sub 30	0.04854	113.279	01Jan2000, 16:00	3.01
Sub 31	0.00814	28.834	01Jan2000, 16:00	3.04
Sub 32	0.01469	46.627	01Jan2000, 16:00	3.04
Sub 33	0.02753	68.695	01Jan2000, 16:00	3.02
Sub 34	0.01238	19.284	01Jan2000, 16:05	2.94
Sub 35	0.00096	3.783	01Jan2000, 16:00	5.35
Sub 36	0.01348	21.897	01Jan2000, 16:05	3.14
Sub 37	0.00037	1.907	01Jan2000, 16:00	4.57
Sub 38	0.00125	3.305	01Jan2000, 16:00	4.38

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WINTON ENGINEERING INC.

HEC-HMS DATA

**EAST EXISTING CANYON RED
AFTER DEVELOPMENT**

SCALE 1in. = 180 ft. Sub 20 only: 1 in.= 100 ft.
After 38: 1 in. = 50 ft.

SUB. 10

	sq. in.	% sq. mi.	CN _{2,7} Imp Length	Slope	n	Bottom	Side slope	Shape
plane 1	1.76	50%	77.0	360	0.190	0.13		
plane 2	1.77	50%	77.0	160	0.350	0.13		
channel				585	0.170	0.03	3	0.25 T
total	3.53		0.00410					
			2.62508 ac.					

SUB.11

	sq. in.	% sq. mi.	CN _{2,7} Impv.Length	Slope	n	Bottom	Side slope	Shape
plane 1	10.00	85%	77.0	900	0.150	0.13		
plane 2	1.74	15%	77.0	150	0.110	0.13		
channel				440	0.140	0.03	3	0.25 T
total	11.74		0.01364					
			8.73043 ac.					

SUB.12

	sq. in.	% sq. mi.	CN _{2,7} Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	5.10	61%	77.0	540	0.240	0.13		
plane 2	3.30	39%	77.0	270	0.280	0.13		
channel				450	0.070	0.03	3	0.25 T
total	8.40		0.00976					
			6.24664 ac.					

SUB. 13

	sq. in.	% sq. mi.	CN _{2,7} Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	6.00	72%	77.0	410	0.300	0.13		
plane 2	2.32	28%	77.0	225	0.350	0.13		
channel				650	0.070	0.03	3	0.25 T
total	8.32		0.00967					
			6.18715 ac.					

SUB. 14

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	6.60	72%	77.0	490	0.250	0.13		
plane 2	2.60	28%	77.0	150	0.350	0.13		
channel				560	0.040	0.03	3	0.25 T
total	9.20		0.01069					
			6.84156 ac.					

SUB 15

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	3.85	65%	77.0	650	0.190	0.13		
plane 2	2.06	35%	77.0	180	0.170	0.13		
channel				620	0.090	0.03	3	0.25 T
total	5.91		0.00687					
			4.39496 ac.					

FALLBROOK OAKS
EAST CANYON AFTER

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WINTON ENGINEERING INC.

Junction A

SUB 16

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	11.07	85%		77.0	1280	0.150	0.13		
plane 2	1.88	15%		77.0	380	0.140	0.13		
channel					240	0.060	0.03	3	0.25 T
total	12.95		0.01505						
			9.63024 ac.						

SUB 17

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	6.03	45%		77.0	720	0.09	0.13		
plane 2	7.37	55%		77.0	400	0.140	0.13		
channel					610	0.070	0.03	3	0.25 T
total	13.40		0.01557						
			9.96488 ac.						

Junction B

SUB. 18

	A sq. ft.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	2.50	21%		77.0	110	0.180	0.13		
plane 2	9.44	79%		77.0	630	0.120	0.13		
channel					740	0.030	0.03	3	0.25 T
total	11.94		0.01388						
			8.87916 ac.						

SUB. 19

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	1.18	23%		77.0	90	0.110	0.13		
plane 2	3.90	77%		77.0	360	0.050	0.13		
channel					450	0.040	0.03	3	0.25 T
total	5.08		0.00590						
			3.77773 ac.						

Junction C

SUB.20

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	3.75	58%		77.0	233	0.150	0.13		
plane 2	2.73	42%		77.0	70	0.200	0.13		
channel					280	0.010	0.03	3	0.25 T
total	6.48		0.00232						
			1.4873 ac.						

Junction D

FALLBROOK OAKS
EAST CANYON AFTER

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WINTON ENGINEERING INC.

SUB.21

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.73	49%		77.0	270	0.150	0.13		
plane 2	0.77	51%		77.0	140	0.250	0.13		
channel					270	0.150	0.03		
total	1.50		0.00174				3	0.25	T
			1.11547 ac.						

SUB.22

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	1.20	44%		77.0	160	0.250	0.13		
plane 2	1.50	56%		77.0	250	0.260	0.13		
channel					215	0.120	0.03		
total	2.70		0.00314				3	0.25	T
			2.00785 ac.						

SUB.23

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	1.50	54%		77.0	180	0.190	0.13		
plane 2	1.30	46%		77.0	140	0.170	0.13		
channel					290	0.100	0.03		
total	2.80		0.00325				3	0.25	T
			2.08221 ac.						

SUB.24

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	2.46	62%		77.0	210	0.170	0.13		
plane 2	1.50	38%		77.0	90	0.170	0.13		
channel					490	0.080	0.03		
total	3.96		0.00460				3	0.25	T
			2.94485 ac.						

SUB.25

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	1.64	45%		77.0	150	0.200	0.13		
plane 2	2.00	55%		77.0	160	0.310	0.13		
channel					640	0.130	0.03		
total	3.64		0.00423				3	0.25	T
			2.70688 ac.						

Junction A

SUB.26

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.47	34%		77.0	320	0.230	0.13		
plane 2	0.92	66%		77.0	125	0.240	0.13		
channel					320	0.230	0.03		
total	1.39		0.00162				3	0.25	T
			1.03367 ac.						

FALLBROOK OAKS
EAST CANYON AFTER

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WINTON ENGINEERING INC.

SUB. 27

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	1.04	30%		77.0	90	0.220	0.13		
plane 2	2.40	70%		77.0	180	0.280	0.13		
channel					410	0.130	0.03	0	0.03
total	3.44		0.00400						T
			2.55815 ac.						

SUB. 28

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	3.00	44%		77.0	180	0.290	0.13		
plane 2	3.76	56%		77.0	300	0.200	0.13		
channel					525	0.090	0.03	3	0.25
total	6.76		0.00786						T
			5.02706 ac.						

SUB. 29

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	3.52	31%		77.0	500	0.130	0.13		
plane 2	7.92	69%		77.0	630	0.110	0.13		
channel					495	0.060	0.03	3	0.25
total	11.44		0.01330						T
			8.50733 ac.						

SUB.30

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	4.06	22%		77.0	470	0.140	0.13		
plane 2	14.66	78%		77.0	1000	0.100	0.13		
channel					420	0.130	0.03	3	0.25
total	18.72		0.02176						T
			13.9211 ac.						

Junction B

SUB.31

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	2.56	37%		77.0	250	0.220	0.13		
plane 2	4.44	63%		77.0	360	0.150	0.13		
channel					630	0.170	0.03	3	0.25
total	7.00		0.00814						T
			5.20554 ac.						

SUB.32

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	2.60	46%		77.0	360	0.150	0.13		
plane 2	3.04	54%		77.0	310	0.190	0.13		
channel					590	0.090	0.03	3	0.25
total	5.64		0.00655						T
			4.19417 ac.						

FALLBROOK OAKS
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WINTON ENGINEERING INC.

SUB.33

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	9.80	89%		77.0	770 0.140	0.13			
plane 2	1.25	11%		77.0	360 0.170	0.13			
channel					540 0.080	0.03	3	0.25	T
total	11.05		0.01284						
			8.21731 ac.						

SUB.34

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	10.65	100%		77.0	1400 0.140	0.13			
plane 2									
channel					1350 0.100	0.03	3	0.25	T
total	10.65		0.01238						
			7.91985 ac.						

SUB.35

RECHE ROAD

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.83	100%		0.0	27 0.057	0.1			
plane 2									
channel					1350 0.050	0.05		0.25	t
total	0.83		0.00096						
			0.61723 ac.						

Junction E

SUB.36

RECHE ROAD

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.12	100%		99.0	54 0.057	0.1			
plane 2									
channel					100 0.050	0.05		4	t
total	0.12		0.00014						
			0.08924 ac.						

SUB.37

RANGER ROAD

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.16	50%		99.0	102 0.100	0.1			
plane 2	0.16	50%		84.0	5 0.200	0.005			
channel					320 0.100	0.05		4	t
total	0.32		0.00037						
			0.23797 ac.						

SUB.38

RANGER ROAD

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.05	50%		99.0	102 0.100	0.1			
plane 2	0.05	50%		84.0	5 0.200	0.005			
channel					80 0.100	0.05		0.25	t
total	0.10		0.00012						
			0.07436 ac.						

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WINTON ENGINEERING INC.

LOT 16-39		right side yard							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.51	75%	84.0	19	15	0.040	0.5		
plane 2	0.17	25%	84.0		5	0.500	0.5		
channel					90	0.010	0.5		
total	0.68		0.00006						16 t
			0.03902 ac.						

Junction 1

LOT 16-40		rear roof							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.46	100%	99.0		16	0.300	0.1		
plane 2									
channel					72	0.005	0.012	0.3	
total	0.46		0.00004						C
			0.02639 ac.						

LOT 16-41		right side yard							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.12	75%	84.0		15	0.040	0.5		
plane 2	0.04	25%	84.0		5	0.500	0.5		
channel					20	0.010	0.5		
total	0.16		0.00001						16 t
			0.00918 ac.						

LOT 16_42		16 rear yard							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.30	50%	84.0	33	10	0.070	0.5		
plane 2	0.30	50%	84.0		10	0.050	0.5		
channel					70	0.010	0.5		
total	0.60		0.00005						32 t
			0.03443 ac.						

LOT 16-43		left side yard							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.24	50%	84.0		10	0.030	0.5		
plane 2	0.24	50%	84.0		10	0.500	0.5		
channel					50	0.010	0.5		
total	0.48		0.00004						10 t
			0.02754 ac.						

Junction 2

LOT 16-44		front roof							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.58	100%	99.0		16	0.300	0.1		
plane 2									
channel					61	0.005	0.012	0.3	
total	0.58		0.00005						C
			0.03328 ac.						

FALLBROOK OAKS
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WINTON ENGINEERING INC.

LOT 16-45		left side yard		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, ft.	Slope			
plane 1	0.15	50%	84.0	10	0.005	0.5	
plane 2	0.15	50%		10	0.050	0.5	
channel				30	0.010	0.5	
total	0.30		0.00003				10 t
			0.01721 ac.				

LOT 16-46		front yard		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, ft.	Slope			
plane 1	0.28	64%	78.0	2	20	0.010	0.5
plane 2	0.16	36%		10	0.010	0.5	
channel				60	0.010	0.5	
total	0.44		0.00004				35 t
			0.02525 ac.				

Junction F

LOT 16-47		drive		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, ft.	Slope			
plane 1	0.24	100%	99.0	20	0.030	0.1	
plane 2		0%					
channel				30	0.050	0.012	0.3
total	0.24		0.00002				C
			0.01377 ac.				

LOT 16-48		street		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, ft.	Slope			
plane 1	0.02	33%	84.0	5	0.200	0.5	
plane 2	0.04	67%	99.0	102	0.100	0.1	
channel				65	0.100	0.005	
total	0.06		0.00001				4 t
			0.00344 ac.				

Junction G

LOT 17-49		right side yard		n	Bottom	Side slope	Shape
	7 A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, ft.	Slope			
plane 1	0.23	61%	84.0	15	0.100	0.5	
plane 2	0.15	39%	84.0	10	0.500	0.5	
channel				38	0.010	0.5	
total	0.38		0.00003				10 t
			0.0218 ac.				

Junction 3

LOT 17-50		right front roof		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, ft.	Slope			
plane 1	0.36	100%	99.0	11	0.300	0.1	
plane 2		0%					
channel				21	0.010	0.012	
total	0.36		0.00003				C
			0.02066 ac.				

FALLBROOK OAKS
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WINTON ENGINEERING INC.

LOT 17-51		right side yard							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.30	60%		84.0	48	15	0.030	0.5	
plane 2	0.20	40%		84.0		10	0.500	0.5	
channel						60	0.010	0.5	
total	0.50		0.00004						10 t
				0.02869 ac.					

LOT 17-52		rear yard							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.30	60%		84.0	40	15	0.010	0.5	
plane 2	0.20	40%		84.0		10	0.050	0.5	
channel						85	0.010	0.5	
total	0.50		0.00004						35 t
				0.02869 ac.					

Junction 4

LOT 17-53		rear roof							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.54	100%		99.0		26	0.300	0.1	
plane 2		0%							
channel						52	0.005	0.012	
total	0.54		0.00005						C
			0.03099 ac.						

LOT 17-54		left side yard							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.18	4%		84.0		35	0.020	0.5	
plane 2	4.10	96%		84.0		58	0.010	0.5	
channel						80	0.010	0.5	
total	4.28		0.00038						67 t
			0.24559 ac.						

LOT 17-55		front yard							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.18	60%		84.0	3	15	0.030	0.5	
plane 2	0.12	40%		84.0		10	0.050	0.5	
channel						65	0.005	0.5	
total	0.30		0.00003						10 t
			0.01721 ac.						

Junction 5

LOT 17-56		left garage roof							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.36	100%		99.0		11	0.300	0.1	
plane 2		0%							
channel						21	0.012	0.012	
total	0.36		0.00003						C
			0.02066 ac.						

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WINTON ENGINEERING INC.

LOT 17-57		drive							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.20	100%		99.0		25	0.300	0.1	
plane 2		0%							
channel						20	0.012	0.012	0.3
total	0.20		0.00002						C
			0.01148 ac.						

Junction H

LOT 17-58		street							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.10	67%		99.0		102	0.100	0.1	
plane 2	0.05	33%		84.0		5	0.200	0.005	
channel						160	0.100	0.005	4 t
total	0.15		0.00001						
			0.00861 ac.						

LOT 17-59		street							
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, ft.	Slope	n	Bottom	Side slope	Shape
plane 1	0.04	67%		99.0		102	0.100	0.1	
plane 2	0.02	33%		84.0		5	0.200	0.005	
channel						65	0.100	0.005	4 t
total	0.06		0.00001						
			0.00344 ac.						

Chapter 6 – Results for Existing Conditions – Center Canyon

WINTON ENGINEERING INC.

Project: COE 6-24 CENTER CANYON BEFORE DEVELOPMENT

Start of Run: 01 Jan 2000 00:00 Basin Model: Basin 1
 End of Run: 02 Jan 2000 00:00 Meteorolic Model: Met 1
 Compute Time 12 Dec 2007 18:05:56 Control Specifications Control 1

BEFORE DEVELOPMENT Junction G 264.1 ac. 804 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Junction A	0.05259	126.566	01Jan2000, 16:00	3.01
Junction B	0.10184	263.199	01Jan2000, 16:00	3.02
Junction C	0.13573	342.098	01Jan2000, 16:00	3.03
Junction D	0.19358	472.953	01Jan2000, 16:00	3.04
Junction E	0.23984	574.553	01Jan2000, 16:00	3.04
Junction F	0.36186	781.809	01Jan2000, 16:00	3.03
Junction G	0.41259	803.809	01Jan2000, 16:05	3.03
Sub 1	0.00300	12.287	01Jan2000, 16:00	3.07
Sub 10	0.00166	4.082	01Jan2000, 16:00	3.00
Sub 11	0.00778	20.710	01Jan2000, 16:00	3.01
Sub 12	0.02030	43.473	01Jan2000, 16:00	2.98
Sub 13	0.02730	63.790	01Jan2000, 16:00	2.99
Sub 130	0.00501	16.035	01Jan2000, 16:00	3.02
Sub 131	0.01302	41.706	01Jan2000, 16:00	3.03
Sub 132	0.02258	71.889	01Jan2000, 16:00	3.04
Sub 133	0.03398	92.274	01Jan2000, 16:00	3.03
Sub 14	0.03627	81.044	01Jan2000, 16:00	2.99
Sub 15	0.04285	98.336	01Jan2000, 16:00	3.00
Sub 16	0.06522	152.214	01Jan2000, 16:00	3.01
Sub 17	0.11432	275.468	01Jan2000, 16:00	3.03
Sub 18	0.14490	359.981	01Jan2000, 16:00	3.03
Sub 19	0.14991	349.415	01Jan2000, 16:00	3.03
Sub 2	0.00974	28.230	01Jan2000, 16:00	3.04
Sub 20	0.19948	459.479	01Jan2000, 16:00	3.04
Sub 21	0.25809	532.248	01Jan2000, 16:05	3.03
Sub 22	0.39573	822.100	01Jan2000, 16:05	3.02
Sub 23	0.40405	826.421	01Jan2000, 16:05	3.03
Sub 24	0.40806	817.834	01Jan2000, 16:05	3.03
Sub 25	0.41259	803.809	01Jan2000, 16:05	3.03
Sub 30	0.00698	27.661	01Jan2000, 16:00	3.06
Sub 31	0.01599	54.308	01Jan2000, 16:00	3.05
Sub 32	0.02315	75.178	01Jan2000, 16:00	3.04

WINTON ENGINEERING INC.

BEFORE DEVELOPMENT Junction G 264.1 ac. 804 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Sub 33	0.03015	94.321	01Jan2000, 16:00	3.05
Sub 34	0.03798	118.623	01Jan2000, 16:00	3.05
Sub 35	0.04367	123.538	01Jan2000, 16:00	3.05
Sub 40	0.00200	7.502	01Jan2000, 16:00	3.05
Sub 41	0.00967	36.926	01Jan2000, 16:00	3.06
Sub 42	0.01588	51.985	01Jan2000, 16:00	3.05
Sub 43	0.02121	66.967	01Jan2000, 16:00	3.04
Sub 44	0.03662	110.986	01Jan2000, 16:00	3.04
Sub 60	0.00260	9.631	01Jan2000, 16:00	3.05
Sub 61	0.01237	42.559	01Jan2000, 16:00	3.04
Sub 62	0.02141	66.629	01Jan2000, 16:00	3.04
Sub 70	0.00551	14.816	01Jan2000, 16:00	3.00
Sub 71	0.02283	58.141	01Jan2000, 16:00	3.00
Sub 72	0.02778	72.659	01Jan2000, 16:00	3.01
Sub 80	0.00074	2.713	01Jan2000, 16:00	3.05
Sub 81	0.00378	11.827	01Jan2000, 16:00	3.02
Sub 82	0.00692	23.993	01Jan2000, 16:00	3.05
Sub 83	0.01258	42.415	01Jan2000, 16:00	3.05
Sub 90	0.00945	28.394	01Jan2000, 16:00	3.02
Sub 91	0.01498	46.177	01Jan2000, 16:00	3.03
Sub 92	0.03452	95.511	01Jan2000, 16:00	3.02

FALLBROOK OAKS
CENTER CANYON BEFORE

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WINTON ENGINEERING INC.

HEC-HMS DATA

SCALE 1in. = 180 ft.

**CENTER CANYON BLUE
BEFORE DEVELOPMENT**

SCALE 1 = 100 ft.

SUB. 10

	sq. in.	% sq. mi.	CN _{2.7}	Imp	Length	Slope	n	Bottom	Side slope	Shape
plane 1	0.48	34%	77.0	790	0.330	0.13				
plane 2	0.95	66%	77.0	790	0.330	0.13				
channel				450	0.330	0.03	3	0.25	T	
total	1.43		0.00166							
			1.063417 ac.							

SUB. 11

	sq. in.	% sq. mi.	CN _{2.7}	Imp.	Length	Slope	n	Bottom	Side slope	Shape
plane 1	3.26	62%	77.0	630	0.250	0.13				
plane 2	2.01	38%	77.0	380	0.130	0.13				
channel				340	0.220	0.03	3	0.25	T	
total	5.27		0.00612							
			3.919025 ac.							

SUB. 12

	sq. in.	% sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	Side slope	Shape	
plane 1	8.54	79%	77.0	920	0.080	0.13				
plane 2	2.23	21%	77.0	290	0.110	0.13				
channel				135	0.110	0.03	3	0.25	T	
total	10.77		0.01252							
			8.009089 ac.							

SUB. 13

	sq. in.	% sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	Side slope	Shape	
plane 1	4.52	75%	77.0	700	0.350	0.13				
plane 2	1.50	25%	77.0	240	0.300	0.13				
channel				200	0.100	0.03	3	0.25	T	
total	6.02		0.00700							
			4.476761 ac.							

SUB. 14

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	Side slope	Shape	
plane 1	4.32	56%	77.0	830	0.280	0.13				
plane 2	3.40	44%	77.0	410	0.100	0.13				
channel				235	0.020	0.03	3	0.25	T	
total	7.72		0.00897							
			5.740963 ac.							

SUB 15

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	Side slope	Shape	
plane 1	1.62	29%	77.0	800	0.470	0.13				
plane 2	4.04	71%	77.0	360	0.280	0.13				
channel				378	0.090	0.03	3	0.25	T	
total	5.66		0.00658							
			4.209048 ac.							

FALLBROOK OAKS
CENTER CANYON BEFORE

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WINTON ENGINEERING INC.

Junction A

SUB 1

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.64	64%	77.0 230 0.420	0.13			
plane 2	0.94	36%	77.0 230 0.420	0.13			
channel			230 0.420	0.03	3	0.25	T
total	2.58		0.00300 1.918612 ac.				

SUB 2

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	4.60	79%	77.0 580 0.190	0.13			
plane 2	1.20	21%	77.0 580 0.190	0.13			
channel			580 0.190	0.03	3	0.25	T
total	5.80		0.00674 4.313158 ac.				

Junction A

SUB. 16

	A sq. ft.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	4.64	43%	77.0 630 0.180	0.13			
plane 2	6.23	57%	77.0 400 0.350	0.13			
channel			555 0.045	0.03	3	0.25	T
total	10.87		0.01263 8.083454 ac.				

Junction B

SUB. 40

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.31	76%	77.0 250 0.130	0.13			
plane 2	0.41	24%	77.0 160 0.310	0.13			
channel			100 0.280	0.03	3	0.25	T
total	1.72		0.00200 1.279075 ac.				

SUB.41

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	2.80	42%	77.0 200 0.200	0.13			
plane 2	3.80	58%	77.0 300 0.400	0.13			
channel			380 0.105	0.03	3	0.25	T
total	6.60		0.00767 4.908077 ac.				

SUB.42

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.77	71%	77.0 560 0.130	0.13			
plane 2	1.57	29%	77.0 300 0.350	0.13			
channel			325 0.110	0.03	3	0.25	T
total	5.34		0.00621 3.97108 ac.				

FALLBROOK OAKS
CENTER CANYON BEFORE

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WINTON ENGINEERING INC.

SUB.43

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.22	70%	77.0	520	0.230	0.13	
plane 2	1.37	30%	77.0	220	0.280	0.13	
channel				280	0.160	0.03	
total	4.59		0.00533			3	0.25 T
			3.413344 ac.				

SUB 44

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	8.30	63%	77.0	600	0.230	0.13	
plane 2	4.96	37%	77.0	300	0.350	0.13	
channel				470	0.130	0.03	
total	13.26		0.01541			3	0.25 T
			9.860773 ac.				

Junction B

SUB.17

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	7.44	69%	77.0	800	0.250	0.13	
plane 2	3.30	31%	77.0	360	0.230	0.13	
channel				700	0.090	0.03	
total	10.74		0.01248			3	0.25 T
			7.98678 ac.				

Junction C

SUB.60

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.21	54%	77.0	340	0.250	0.13	
plane 2	1.03	46%	77.0	215	0.230	0.13	
channel				460	0.490	0.03	
total	2.24		0.00260			3	0.25 T
			1.665772 ac.				

SUB.61

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	6.16	73%	77.0	400	0.250	0.13	
plane 2	2.25	27%	77.0	160	0.140	0.13	
channel				650	0.200	0.03	
total	8.41		0.00977			3	0.25 T
			6.25408 ac.				

SUB.62

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	5.88	76%	77.0	540	0.200	0.13	
plane 2	1.90	24%	77.0	150	0.300	0.13	
channel				560	0.140	0.03	
total	7.78		0.00904			0	0.03 T
			5.785581 ac.				

**FALLBROOK OAKS
CENTER CANYON BEFORE**

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WINTON ENGINEERING INC.

Junction C

SUB. 18

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	6.30	80%		77.0	300	0.140	0.13	
plane 2	1.59	20%		77.0	180	0.280	0.13	
channel					320	0.050	0.03	
total	7.89		0.00917				3	0.25 T
			5.867383 ac.					

SUB. 19

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.16	73%		77.0	320	0.250	0.13	
plane 2	1.15	27%		77.0	130	0.500	0.13	
channel					430	0.020	0.03	
total	4.31		0.00501				3	0.25 T
			3.205123 ac.					

JUNCTION D

SUB.30

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.71	62%		77.0	180	0.180	0.13	
plane 2	2.30	38%		77.0	140	0.080	0.13	
channel					720	0.250	0.03	
total	6.01		0.00698				3	0.25 T
			4.469325 ac.					

SUB.31

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.90	50%		77.0	450	0.160	0.03	
plane 2	3.85	50%		77.0	290	0.200	0.13	
channel					380	0.080	0.13	
total	7.75		0.00901				3	0.25 T
			5.763272 ac.					

SUB.32

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	2.24	36%		77.0	400	0.290	0.13	
plane 2	3.92	64%		77.0	430	0.200	0.13	
channel					225	0.090	0.03	
total	6.16		0.00716				3	0.25 T
			4.580872 ac.					

SUB.33

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	2.34	39%		77.0	250	0.280	0.13	
plane 2	3.68	61%		77.0	430	0.220	0.13	
channel					360	0.070	0.03	
total	6.02		0.00700				3	0.25 T
			4.476761 ac.					

**FALLBROOK OAKS
CENTER CANYON BEFORE**

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WINTON ENGINEERING INC.**SUB.34**

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.83	27%		77.0	200	0.170	0.13		
plane 2	4.91	73%		77.0	320	0.280	0.13		
channel					320	0.080	0.03		
total	6.74		0.00783				3	0.25	T
			5.012188 ac.						

SUB.35

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.02	21%		77.0	40	0.600	0.13		
plane 2	3.88	79%		77.0	180	0.420	0.13		
channel					850	0.050	0.03		
total	4.90		0.00569				3	0.25	T
			3.643875 ac.						

Junction D**SUB.20**

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.50	49%		77.0	300	0.150	0.13		
plane 2	2.58	51%		77.0	180	0.230	0.13		
channel					430	0.020	0.03		
total	5.08		0.00590				3	0.25	T
			3.777732 ac.						

Junction E**SUB 70**

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.87	61%		77.0	600	0.150	0.13		
plane 2	1.87	39%		77.0	340	0.200	0.13		
channel					620	0.230	0.03		
total	4.74		0.00551				3	0.25	T
			3.524892 ac.						

SUB.71

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	11.23	75%		77.0	720	0.250	0.13		
plane 2	3.67	25%		77.0	450	0.210	0.13		
channel					550	0.160	0.03		
total	14.90		0.01732				3	0.25	T
			11.08036 ac.						

SUB.72

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.08	25%		77.0	50	0.400	0.13		
plane 2	3.18	75%		77.0	180	0.280	0.13		
channel					760	0.150	0.03		
total	4.26		0.00495				3	0.25	T
			3.167941 ac.						

Junction E

CENTER CANYON BEFORE

12 September 2007

WINTON ENGINEERING INC.

SUB 80

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.32	50%	77.0	250 0.250	0.13			
plane 2	0.32	50%	77.0	250 0.250	0.13			
channel				250 0.250	0.03	3	0.25	T
total	0.64		0.00074					
			0.475935 ac.					

SUB.81

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.20	46%	77.0	390 0.190	0.13			
plane 2	1.42	54%	77.0	390 0.190	0.13			
channel				390 0.190	0.03	3	0.25	T
total	2.62		0.00304					
			1.948358 ac.					

SUB. 82

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.50	56%	77.0	240 0.280	0.13			
plane 2	1.20	44%	77.0	189 0.280	0.13			
channel				270 0.310	0.03	3	0.25	T
total	2.70		0.00314					
			2.00785 ac.					

SUB. 83

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.63	75%	77.0	320 0.280	0.13			
plane 2	1.24	25%	77.0	70 0.400	0.13			
channel				670 0.130	0.03	3	0.25	T
total	4.87		0.00566					
			3.621566 ac.					

Junction E

SUB. 21

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	7.69	49%	77.0	220 0.230	0.13			
plane 2	8.01	51%	77.0	290 0.190	0.13			
channel				1780 0.050	0.03	3	0.25	T
total	15.70		0.01825					
			11.67527 ac.					

Junction F

SUB. 90

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.91	48%	77.0	220 0.230	0.13			
plane 2	4.22	52%	77.0	290 0.190	0.13			
channel				1780 0.080	0.03	3	0.25	T
total	8.13		0.00945					
			6.045858 ac.					

FALLBROOK OAKS
CENTER CANYON BEFORE

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WINTON ENGINEERING INC.

SUB. 91

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.86	39%	77.0 220 0.350	0.13			
plane 2	2.90	61%	77.0 290 0.200	0.13			
channel			520 0.110	0.03	3	0.25	T
total	4.76		0.00553				
			3.539765 ac.				

SUB. 92

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	12.20	72%	77.0 550 0.250	0.13			
plane 2	4.70	28%	77.0 360 0.170	0.13			
channel			700 0.080	0.03	3	0.25	T
total	16.90		0.01964				
			12.56765 ac.				

SUB. 93

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	17.08	56%	77.0 550 0.250	0.13			
plane 2	13.27	44%	77.0 360 0.170	0.13			
channel			1040 0.040	0.03	3	0.25	T
total	30.35		0.03527				
			22.56972 ac.				

Junction F

SUB. 130

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.80	42%	77.0 350 0.200	0.13			
plane 2	2.51	58%	77.0 350 0.200	0.13			
channel			520 0.100	0.03	3	0.25	T
total	4.31		0.00501				
			3.205123 ac.				

SUB. 131

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.10	45%	77.0 270 0.170	0.13			
plane 2	3.79	55%	77.0 350 0.200	0.13			
channel			500 0.100	0.03	3	0.25	T
total	6.89		0.00801				
			5.123735 ac.				

SUB. 132

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.13	38%	77.0 230 0.250	0.13			
plane 2	5.10	62%	77.0 320 0.250	0.13			
channel			630 0.080	0.03	3	0.25	T
total	8.23		0.00956				
			6.120223 ac.				

CENTER CANYON BEFORE

12 September 2007

WINTON ENGINEERING INC.

SUB. 133

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.74	38%	77.0	100	0.250	0.13	
plane 2	6.07	62%	77.0	320	0.170	0.13	
channel				1480	0.080	0.03	
total	9.81		0.01140			3	0.25
			7.295187 ac.				T

Juction F

SUB. 22

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	20.77	71%	77.0	630	0.120	0.13	
plane 2	8.37	29%	77.0	550	0.060	0.13	
channel				1500	0.030	0.03	
total	29.14		0.03387			3	0.25
			21.6699 ac.				T

SUB. 23

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	20.78	90%	77.0	557	0.230	0.13	
plane 2	2.41	10%	77.0	100	0.250	0.13	
channel				400	0.025	0.03	
total	23.19		0.00832			3	0.25
			5.322592 ac.				T

SUB. 24

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	9.59	86%	77.0	541	0.240	0.13	
plane 2	1.58	14%	77.0	100	0.130	0.13	
channel				440	0.016	0.03	
total	11.17		0.00401			3	0.25
			2.563749 ac.				T

SUB. 25

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	7.64	60%	84.0	276	0.280	0.13	
plane 2	4.99	40%	77.0	150	0.100	0.13	
channel				325	0.016	0.05	
total	12.63		0.00453			3	0.25
			2.89885 ac.				T

Chapter 7 – Results for Developed Conditions – Center Canyon

WINTON ENGINEERING INC.

Project: COE 6-24 CENTER CANYON AFTER DEVELOPMENT

Start of Run: 01 Jan 2000 00:00
End of Run: 02 Jan 2000 00:00
Compute Tim 12 Dec 2007 14:51:45

Basin Model: Basin 1
Meteorolic Model: Met 1
Control Specifications: Control 1

FALLBROOK OAKS Junction G 264.1 ac. 803.7 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Junction 1	0.00004	0.115	01Jan2000, 16:00	4.11
Junction 10	0.00042	0.58	01Jan2000, 16:15	3.71
Junction 11	0.00200	3.898	01Jan2000, 16:00	4.16
Junction 12	0.00274	4.926	01Jan2000, 16:00	4.06
Junction 13	0.00336	5.656	01Jan2000, 16:00	4.1
Junction 14	0.00041	0.796	01Jan2000, 16:05	4.17
Junction 15	0.00362	6.571	01Jan2000, 16:00	4.15
Junction 16	0.00001	0.055	01Jan2000, 16:00	5.38
Junction 17	0.00424	7.354	01Jan2000, 16:00	4.15
Junction 18	0.00048	0.909	01Jan2000, 16:05	3.91
Junction-2	0.00009	0.236	01Jan2000, 16:00	4.42
Junction 3	0.00067	1.136	01Jan2000, 16:00	4.04
Junction 4	0.00036	0.603	01Jan2000, 16:15	3.98
Junction 5	0.00134	2.152	01Jan2000, 16:05	4.09
Junction 6	0.00181	3.274	01Jan2000, 16:05	4.03
Junction 7	0.00034	0.623	01Jan2000, 16:00	4.33
Junction 8	0.00031	1.002	01Jan2000, 16:00	3.75
Junction 9	0.00186	3.31	01Jan2000, 16:05	4.06
Junction A	0.05259	126.566	01Jan2000, 16:00	3.01
Junction B	0.10184	263.199	01Jan2000, 16:00	3.02
Junction C	0.13573	342.098	01Jan2000, 16:00	3.03
Junction D	0.19358	472.953	01Jan2000, 16:00	3.04
Junction E	0.23984	574.553	01Jan2000, 16:00	3.04
Junction F	0.36186	781.809	01Jan2000, 16:00	3.03
Junction G	0.41289	803.739	01Jan2000, 16:05	3.04
LOT 5-182	0.00004	0.102	01Jan2000, 16:05	3.69
LOT 5-183	0.00001	0.055	01Jan2000, 16:00	5.38
LOT 5-184	0.00005	0.093	01Jan2000, 16:15	4
LOT 5-185	0.00365	6.668	01Jan2000, 16:00	4.16
LOT 5-186	0.00001	0.055	01Jan2000, 16:00	5.37
LOT 5-187	0.00371	6.943	01Jan2000, 16:00	4.18
LOT 5-188	0.00005	0.279	01Jan2000, 16:00	5.38

WINTON ENGINEERING INC.

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
LOT 5-189	0.00039	0.774	01Jan2000, 16:10	3.84
LOT 5-190	0.00006	0.154	01Jan2000, 16:05	3.67
LOT 5-191	0.00003	0.164	01Jan2000, 16:00	5.37
LOT 5-192	0.00052	0.926	01Jan2000, 16:15	3.86
LOT 5-193	0.00428	7.498	01Jan2000, 16:00	4.16
LOT 6-173	0.00013	0.241	01Jan2000, 16:05	3.68
LOT 6-174	0.00276	4.700	01Jan2000, 16:00	4.07
LOT 6-175	0.00285	5.169	01Jan2000, 16:00	4.11
LOT 6-176	0.00008	0.440	01Jan2000, 16:00	5.37
LOT 6-177	0.00034	0.728	01Jan2000, 16:05	4.02
LOT 6-178	0.00002	0.094	01Jan2000, 16:00	3.74
LOT 6-179	0.00005	0.278	01Jan2000, 16:00	5.38
LOT 6-180	0.00051	0.92	01Jan2000, 16:05	4.05
LOT 6-181	0.00353	6.409	01Jan2000, 16:00	4.16
LOT 7-161	0.00030	0.947	01Jan2000, 16:00	3.70
LOT 7-162	0.00001	0.055	01Jan2000, 16:00	5.38
LOT 7-163	0.00039	1.059	01Jan2000, 16:05	3.72
LOT 7-164	0.00183	3.283	01Jan2000, 16:05	4.04
LOT 7-165	0.00003	0.167	01Jan2000, 16:00	5.38
LOT 7-166	0.00200	3.898	01Jan2000, 16:00	4.16
LOT 7-167	0.00005	0.279	01Jan2000, 16:00	5.38
LOT 7-168	0.00033	0.519	01Jan2000, 16:10	3.61
LOT 7-169	0.00039	0.566	01Jan2000, 16:15	3.58
LOT 7-170	0.00003	0.167	01Jan2000, 16:00	5.39
lot 7-171	0.00051	0.63	01Jan2000, 16:20	3.68
lot 7-172	0.00261	4.728	01Jan2000, 16:00	4.08
LOT 8-152	0.00005	0.077	01Jan2000, 16:05	3.66
LOT 8-153	0.00073	1.246	01Jan2000, 16:00	4.03
LOT 8-154	0.00078	1.502	01Jan2000, 16:00	4.11
LOT 8-155	0.00008	0.440	01Jan2000, 16:00	5.37
lot 8-156	0.00018	0.476	01Jan2000, 16:10	4.38
lot 8-157	0.00028	0.561	01Jan2000, 16:15	4.10
LOT 8-158	0.00006	0.333	01Jan2000, 16:00	5.38
LOT 8-159	0.00056	1.016	01Jan2000, 16:05	4.05
LOT 8-160	0.00142	2.382	01Jan2000, 16:00	4.11
LOT 9-140	0.00003	0.066	01Jan2000, 16:05	3.69
LOT 9-141	0.00001	0.056	01Jan2000, 16:00	5.38
LOT 9-142	0.00006	0.127	01Jan2000, 16:10	3.94
LOT 9-143	0.00008	0.180	01Jan2000, 16:00	4.30
LOT 9-144	0.00001	0.055	01Jan2000, 16:00	5.37
LOT 9-145	0.00013	0.446	01Jan2000, 16:00	4.71
LOT 9-146	0.00018	0.612	01Jan2000, 16:00	4.44

WINTON ENGINEERING INC.

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
LOT 9-147	0.00005	0.279	01Jan2000, 16:00	5.38
LOT 9-148	0.00015	0.420	01Jan2000, 16:10	4.20
LOT 9-149	0.00033	0.589	01Jan2000, 16:15	3.86
LOT 9-150	0.00003	0.167	01Jan2000, 16:00	5.39
LOT 9-151	0.00049	0.701	01Jan2000, 16:05	3.89
PIPE1	0.00428	7.224	01Jan2000, 16:00	4.16
Sub 1	0.003	12.287	01Jan2000, 16:00	3.07
Sub 10	0.00166	4.082	01Jan2000, 16:00	3.00
Sub 11	0.00778	20.710	01Jan2000, 16:00	3.01
Sub 12	0.0203	43.473	01Jan2000, 16:00	2.98
Sub 13	0.0273	63.790	01Jan2000, 16:00	2.99
Sub 130	0.00501	16.035	01Jan2000, 16:00	3.02
Sub 131	0.01302	41.706	01Jan2000, 16:00	3.03
Sub 132	0.02258	71.889	01Jan2000, 16:00	3.04
Sub 133	0.03398	92.274	01Jan2000, 16:00	3.03
Sub 14	0.03627	81.044	01Jan2000, 16:00	2.99
Sub 15	0.04285	98.336	01Jan2000, 16:00	3.00
Sub 16	0.06522	152.214	01Jan2000, 16:00	3.01
Sub 17	0.11432	275.468	01Jan2000, 16:00	3.03
Sub 18	0.1449	359.981	01Jan2000, 16:00	3.03
Sub 19	0.14991	349.415	01Jan2000, 16:00	3.03
Sub 2	0.00974	28.230	01Jan2000, 16:00	3.04
Sub 20	0.19948	459.479	01Jan2000, 16:00	3.04
Sub 21	0.25809	532.248	01Jan2000, 16:05	3.03
Sub 22	0.39573	820.823	01Jan2000, 16:05	3.02
Sub 23	0.40151	817.593	01Jan2000, 16:05	3.02
Sub 24	0.40408	805.299	01Jan2000, 16:05	3.03
Sub 25	0.41289	803.739	01Jan2000, 16:05	3.04
Sub 30	0.00698	27.661	01Jan2000, 16:00	3.06
Sub 31	0.01599	54.308	01Jan2000, 16:00	3.05
Sub 32	0.02315	75.178	01Jan2000, 16:00	3.04
Sub 33	0.03015	94.321	01Jan2000, 16:00	3.05
Sub 34	0.03798	118.623	01Jan2000, 16:00	3.05
Sub 35	0.04367	123.538	01Jan2000, 16:00	3.05
Sub 40	0.002	7.502	01Jan2000, 16:00	3.05
Sub 41	0.00967	36.926	01Jan2000, 16:00	3.06
Sub 42	0.01588	51.985	01Jan2000, 16:00	3.05
Sub 43	0.02121	66.967	01Jan2000, 16:00	3.04
Sub 44	0.03662	110.986	01Jan2000, 16:00	3.04
Sub 60	0.0026	9.631	01Jan2000, 16:00	3.05
Sub 61	0.01237	42.559	01Jan2000, 16:00	3.04
Sub 62	0.02141	66.629	01Jan2000, 16:00	3.04

WINTON ENGINEERING INC.

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Sub 70	0.00551	14.816	01Jan2000, 16:00	3.00
Sub 71	0.02283	58.141	01Jan2000, 16:00	3.00
Sub 72	0.02778	72.659	01Jan2000, 16:00	3.01
Sub 80	0.00074	2.713	01Jan2000, 16:00	3.05
Sub 81	0.00378	11.827	01Jan2000, 16:00	3.02
Sub 82	0.00692	23.993	01Jan2000, 16:00	3.05
Sub 83	0.01258	42.415	01Jan2000, 16:00	3.05
Sub 90	0.00945	28.394	01Jan2000, 16:00	3.02
Sub 91	0.01498	46.177	01Jan2000, 16:00	3.03
Sub 92	0.03452	95.511	01Jan2000, 16:00	3.02
Sub 93	0.06979	174.157	01Jan2000, 16:00	3.01

FALLBROOK OAKS
CENTER CANYON AFTER

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WINTON ENGINEERING INC.

HEC-HMS DATA

CENTER EXISTING CANYON BLUE
AFTER DEVELOPMENT

SCALE 1 in. = 180 ft.

AFTER 22: SCALE 1 in. = 100 ft.

SUB. 10

	sq. in.	% sq. mi.	CN _{2,7} Imp.	Length	Slope	n	Bottom	Side slope	Shape
plane 1	0.48	34%	77.0	790	0.330	0.13			
plane 2	0.95	66%	77.0	790	0.330	0.13			
channel				450	0.330	0.03	3	0.25	T
total	1.43		0.00166						
			1.06342 ac.						

SUB.11

	sq. in.	% sq. mi.	CN _{2,7} Impv.	Length	Slope	n	Bottom	Side slope	Shape
plane 1	3.26	62%	77.0	630	0.250	0.13			
plane 2	2.01	38%	77.0	380	0.130	0.13			
channel				340	0.220	0.03	3	0.25	T
total	5.27		0.00612						
			3.91902 ac.						

SUB.12

	sq. in.	% sq. mi.	CN _{2,7} Imp.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	8.54	79%	77.0	920 0.080	0.13			
plane 2	2.23	21%	77.0	290 0.110	0.13			
channel				135 0.110	0.03	3	0.25	T
total	10.77		0.01252					
			8.00909 ac.					

SUB. 13

	sq. in.	% sq. mi.	CN _{2,7} Imp.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	4.52	75%	77.0	700 0.350	0.13			
plane 2	1.50	25%	77.0	240 0.300	0.13			
channel				200 0.100	0.03	3	0.25	T
total	6.02		0.00700					
			4.47676 ac.					

SUB. 14

	A sq. in.	% A sq. mi.	CN _{2,7} Imperv.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	4.32	56%	77.0	830 0.280	0.13			
plane 2	3.40	44%	77.0	410 0.100	0.13			
channel				235 0.020	0.03	3	0.25	T
total	7.72		0.00897					
			5.74096 ac.					

SUB 15

	A sq. in.	% A sq. mi.	CN _{2,7} Imperv.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.62	29%	77.0	800 0.470	0.13			
plane 2	4.04	71%	77.0	360 0.280	0.13			
channel				378 0.090	0.03	3	0.25	T
total	5.66		0.00658					
			4.20905 ac.					

**FALLBROOK OAKS
CENTER CANYON AFTER**

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WINTON ENGINEERING INC.

Junction A

SUB 1

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.64	64%	77.0		230	0.420	0.13			
plane 2	0.94	36%	77.0		230	0.420	0.13			
channel					230	0.420	0.03	3	0.25	T
total	2.58		0.00300							
			1.91861 ac.							

SUB 2

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	4.60	79%	77.0		580	0.190	0.13			
plane 2	1.20	21%	77.0		580	0.190	0.13			
channel					580	0.190	0.03	3	0.25	T
total	5.80		0.00674							
			4.31316 ac.							

Junction A

SUB. 16

	A sq. ft.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	4.64	43%	77.0		630	0.180	0.13			
plane 2	6.23	57%	77.0		400	0.350	0.13			
channel					555	0.045	0.03	3	0.25	T
total	10.87		0.01263							
			8.08345 ac.							

Junction B

SUB. 40

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.31	76%	77.0		250	0.130	0.13			
plane 2	0.41	24%	77.0		160	0.310	0.13			
channel					100	0.280	0.03	3	0.25	T
total	1.72		0.00200							
			1.27907 ac.							

SUB.41

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.80	42%	77.0		200	0.200	0.13			
plane 2	3.80	58%	77.0		300	0.400	0.13			
channel					380	0.105	0.03	3	0.25	T
total	6.60		0.00767							
			4.90808 ac.							

SUB.42

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.77	71%	77.0		560	0.130	0.13			
plane 2	1.57	29%	77.0		300	0.350	0.13			
channel					325	0.110	0.03	3	0.25	T
total	5.34		0.00621							
			3.97108 ac.							

**FALLBROOK OAKS
CENTER CANYON AFTER**

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WINTON ENGINEERING INC.

SUB.43

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.22	70%		77.0	520 0.230	0.13			
plane 2	1.37	30%		77.0	220 0.280	0.13			
channel					280 0.160	0.03	3	0.25	T
total	4.59		0.00533		3.41334 ac.				

SUB 44

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	8.30	63%		77.0	600 0.230	0.13			
plane 2	4.96	37%		77.0	300 0.350	0.13			
channel					470 0.130	0.03	3	0.25	T
total	13.26		0.01541		9.86077 ac.				

Junction B

SUB.17

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	7.44	69%		77.0	800 0.250	0.13			
plane 2	3.30	31%		77.0	360 0.280	0.13			
channel					700 0.090	0.03	3	0.25	T
total	10.74		0.01248		7.98678 ac.				

Junction C

SUB.60

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.21	54%		77.0	340 0.250	0.13			
plane 2	1.03	46%		77.0	215 0.230	0.13			
channel					460 0.490	0.03	3	0.25	T
total	2.24		0.00260		1.66577 ac.				

SUB.61

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	6.16	73%		77.0	400 0.250	0.13			
plane 2	2.25	27%		77.0	160 0.140	0.13			
channel					650 0.200	0.03	3	0.25	T
total	8.41		0.00977		6.25408 ac.				

SUB.62

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom	Side slope	Shape
plane 1	5.88	76%		77.0	540 0.200	0.13			
plane 2	1.90	24%		77.0	150 0.300	0.13			
channel					560 0.140	0.03	0	0.03	T
total	7.78		0.00904		5.78558 ac.				

Junction C

FALLBROOK OAKS
CENTER CANYON AFTER

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WINTON ENGINEERING INC.

SUB. 18

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	6.30	80%	77.0		300	0.140	0.13			
plane 2	1.59	20%	77.0		180	0.280	0.13			
channel					320	0.050	0.03	3	0.25	T
total	7.89		0.00917							
			5.86738 ac.							

SUB. 19

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.16	73%	77.0		320	0.250	0.13			
plane 2	1.15	27%	77.0		130	0.500	0.13			
channel					430	0.020	0.03	3	0.25	T
total	4.31		0.00501							
			3.20512 ac.							

JUNCTION D

SUB.30

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.71	62%	77.0		180	0.180	0.13			
plane 2	2.30	38%	77.0		140	0.080	0.13			
channel					720	0.250	0.03	3	0.25	T
total	6.01		0.00698							
			4.46932 ac.							

SUB.31

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.90	50%	77.0		450	0.160	0.03			
plane 2	3.85	50%	77.0		290	0.200	0.13			
channel					380	0.080	0.13	3	0.25	T
total	7.75		0.00901							
			5.76327 ac.							

SUB.32

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.24	36%	77.0		400	0.290	0.13			
plane 2	3.92	64%	77.0		430	0.200	0.13			
channel					225	0.090	0.03	3	0.25	T
total	6.16		0.00716							
			4.58087 ac.							

SUB.33

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.34	39%	77.0		250	0.280	0.13			
plane 2	3.68	61%	77.0		430	0.220	0.13			
channel					360	0.070	0.03	3	0.25	T
total	6.02		0.00700							
			4.47676 ac.							

**FALLBROOK OAKS
CENTER CANYON AFTER**

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WINTON ENGINEERING INC.

SUB.34

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.83	27%		77.0		200	0.170	0.13		
plane 2	4.91	73%		77.0		320	0.280	0.13		
channel						320	0.080	0.03	3	0.25
total	6.74		0.00783						0.25	T
			5.01219 ac.							

SUB.35

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.02	21%		77.0		40	0.600	0.13		
plane 2	3.88	79%		77.0		180	0.420	0.13		
channel						850	0.050	0.03	3	0.25
total	4.90		0.00569						0.25	T
			3.64388 ac.							

Junction D

SUB.20

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.50	49%		77.0		300	0.150	0.13		
plane 2	2.58	51%		77.0		180	0.230	0.13		
channel						430	0.020	0.03	3	0.25
total	5.08		0.00590						0.25	T
			3.77773 ac.							

Junction E

SUB 70

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.87	61%		77.0		600	0.150	0.13		
plane 2	1.87	39%		77.0		340	0.200	0.13		
channel						620	0.230	0.03	3	0.25
total	4.74		0.00551						0.25	T
			3.52489 ac.							

SUB.71

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	11.23	75%		77.0		720	0.250	0.13		
plane 2	3.67	25%		77.0		450	0.210	0.13		
channel						550	0.160	0.03	3	0.25
total	14.90		0.01732						0.25	T
			11.0804 ac.							

SUB.72

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.08	25%		77.0		50	0.400	0.13		
plane 2	3.18	75%		77.0		180	0.280	0.13		
channel						760	0.150	0.03	3	0.25
total	4.26		0.00495						0.25	T
			3.16794 ac.							

Junction E

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SUB 80

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	0.32	50%		77.0		250	0.250	0.13		
plane 2	0.32	50%		77.0		250	0.250	0.13		
channel						250	0.250	0.03	3	0.25
total	0.64		0.00074						0.25	T
			0.47593 ac.							

SUB.81

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.20	46%		77.0		390	0.190	0.13		
plane 2	1.42	54%		77.0		390	0.190	0.13		
channel						390	0.190	0.03	3	0.25
total	2.62		0.00304						0.25	T
			1.94836 ac.							

SUB. 82

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.50	56%		77.0		240	0.280	0.13		
plane 2	1.20	44%		77.0		189	0.280	0.13		
channel						270	0.310	0.03	3	0.25
total	2.70		0.00314						0.25	T
			2.00785 ac.							

SUB. 83

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.63	75%		77.0		320	0.280	0.13		
plane 2	1.24	25%		77.0		70	0.400	0.13		
channel						670	0.130	0.03	3	0.25
total	4.87		0.00566						0.25	T
			3.62157 ac.							

Junction E

SUB. 21

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	7.69	49%		77.0		220	0.230	0.13		
plane 2	8.01	51%		77.0		290	0.190	0.13		
channel						1780	0.050	0.03	3	0.25
total	15.70		0.01825						0.25	T
			11.6753 ac.							

Junction F

SUB. 90

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.91	48%		77.0		220	0.230	0.03		
plane 2	4.22	52%		77.0		290	0.190	0.03		
channel						1780	0.500	0.13	3	0.25
total	8.13		0.00945						0.13	T
			6.04586 ac.							

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SUB. 91

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.86	39%		77.0		220	0.350	0.13		
plane 2	2.90	61%		77.0		290	0.200	0.13		
channel						520	0.080	0.03	3	0.25
total	4.76		0.00553							T
			3.53976 ac.							

SUB. 92

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	12.20	72%		77.0		550	0.250	0.13		
plane 2	4.70	28%		77.0		360	0.170	0.13		
channel						700	0.080	0.03	3	0.25
total	16.90		0.01964							T
			12.5677 ac.							

SUB. 93

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	17.08	56%		77.0		550	0.250	0.13		
plane 2	13.27	44%		77.0		360	0.170	0.13		
channel						1040	0.040	0.03	3	0.25
total	30.35		0.03527							T
			22.5697 ac.							

Junction F

SUB. 130

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.80	42%		77.0		350	0.200	0.13		
plane 2	2.51	58%		77.0		350	0.200	0.13		
channel						520	0.100	0.03	3	0.25
total	4.31		0.00501							T
			3.20512 ac.							

SUB. 131

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.10	45%		77.0		270	0.170	0.13		
plane 2	3.79	55%		77.0		350	0.200	0.13		
channel						500	0.100	0.03	3	0.25
total	6.89		0.00801							T
			5.12373 ac.							

SUB. 132

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.13	38%		77.0		230	0.250	0.13		
plane 2	5.10	62%		77.0		320	0.250	0.13		
channel						630	0.080	0.03	3	0.25
total	8.23		0.00956							T
			6.12022 ac.							

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SUB. 133

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	3.74	38%		77.0		100	0.250	0.13		
plane 2	6.07	62%		77.0		320	0.170	0.13		
channel						1480	0.080	0.03	3	0.25
total	9.81		0.01140							T
			7.29519 ac.							

Junction F

SUB. 22

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	20.77	71%		77.0		630	0.120	0.13		
plane 2	8.37	29%		77.0		550	0.060	0.13		
channel						1500	0.030	0.03	3	0.25
total	29.14		0.03387							T
			21.6699 ac.							

SUB. 23

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	13.71	85%		77.0		336	0.270	0.13		
plane 2	2.41	15%		77.0		100	0.250	0.13		
channel						400	0.025	0.03	3	0.25
total	16.12		0.00578							T
			3.69988 ac.							

SUB. 24

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	5.58	78%		77.0		227	0.270	0.13		
plane 2	1.58	22%		77.0		100	0.150	0.13		
channel						440	0.016	0.03	3	0.25
total	7.16		0.00257							T
			1.64337 ac.							

SUB. 25

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	Side slope	Shape
plane 1	7.65	63%		77.0		198	0.280	0.13		
plane 2	4.49	37%		77.0		140	0.100	0.13		
channel						325	0.020	0.03	3	0.25
total	12.14		0.00435							T
			2.78638 ac.							

LOT 9-140 left side yard 2 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.03	43%		84.0	90	7.5	0.067	0.5		
plane 2	0.04	57%		84.0		7.5	0.093	0.5		
channel						50.0	0.005	0.5	0	31
total	0.07		0.00003							t
			0.01607 ac.							

Junction 1 add left garage roof

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LOT 9-141	left garage roof		2 story					
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V
plane 1	0.02	100%	99.0		11.0	0.300	0.1	
plane 2		0%						
channel								
total	0.02		0.00001		55.0	0.005	0.012	0.3
			0.00459 ac.					C

LOT 9-142	left side yard		2 story					
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V
plane 1	0.03	50%	84.0		7.5	0.067	0.5	
plane 2	0.03	50%	84.0		7.5	0.093	0.5	
channel					40.0	0.005	0.5	0
total	0.06		0.00002					31 t
			0.01377 ac.					

LOT 9-143	street		2 story					
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V
plane 1	0.05	100%	99.0		28.0	0.005	0.1	
plane 2		0%						
channel					25.0	0.005	0.05	0
total	0.05		0.00002					4 t
			0.01148 ac.					
Junction 2	add right garage roof							

LOT 9-144	right garage roof		2 story					
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V
plane 1	0.02	100%	99.0		11.0	0.300	0.1	
plane 2		0%						
channel					24.0	0.005	0.012	0.3
total	0.02		0.00001					C
			0.00459 ac.					

LOT 9-145	drive		2 story					
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V
plane 1	0.06	60% drive	99.0		30.0	0.050	0.1	
plane 2	0.04	40% street	99.0		28.0	0.002	0.1	
channel					18.0	0.005	0.012	0.3
total	0.10		0.00004					C
			0.02295 ac.					

LOT 9-146	front yard		2 story					
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V
plane 1	0.14	100%	84.0	2	50.0	0.050	0.5	
plane 2		0%						
channel					25.0	0.005	0.05	0
total	0.14		0.00005					4 t
			0.03213 ac.					

Junction 3 add remaining front yard

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LOT 9-147		LOT 9: rear roof		2 story		H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom
plane 1	0.14	100%	99.0		26.0 0.300	0.1	
plane 2		0%					
channel					52.0 0.005	0.012	0.3
total	0.14	0.00005	0.03213 ac.				

Junction 3

LOT 9-148		LOT 9: rear yard		2 story		H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom
plane 1	0.23	82%	84.0	22	45.0 0.005	0.5	
plane 2	0.05	18%	84.0		10.0 0.062	0.5	
channel					60.0 0.005	0.5	0
total	0.28	0.00010	0.06427 ac.				

LOT 9-149		LOT 9: right yard		2 story		H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom
plane 1	0.05	10%	84.0		10.0 0.095	0.5	
plane 2	0.46	90%	84.0		90.0 0.005	0.5	
channel					60.0 0.005	0.5	0
total	0.51	0.00018	0.11706 ac.				

Junction 4 add front roof

LOT 9-150		LOT 9: front roof		2 story		H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom
plane 1	0.07	100%	99.0		26.0 0.300	0.1	
plane 2		0%					
channel					26.0 0.005	0.012	0.3
total	0.07	0.00003	0.01607 ac.				

LOT 9-151 LOT 9: remaining front yard 2 story

LOT 9-151		LOT 9: remaining front yard		2 story		H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom
plane 1	0.13	36%	84.0		10.0 0.095	0.5	
plane 2	0.23	64%	84.0		36.0 0.005	0.5	
channel					65.0 0.020	0.5	0
total	0.36	0.00013	0.08263 ac.				

Junction 3

LOT 8-152		LOT 8: left side yard		1 story		H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom
plane 1	0.07	50%	84.0	50	7.5 0.067	0.5	
plane 2	0.07	50%	84.0		7.5 0.093	0.5	
channel					92.0 0.005	0.5	0
total	0.14	0.00005	0.03213 ac.				

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LOT 8-153		LOT 8: street		1 story		H:V	Shape		
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom		
plane 1	0.01	100%	99.0		64.0 0.082	0.1			
plane 2		0%							
channel					5.0 0.005	0.05	0		
total	0.01		0.00000					4	t
			0.0023 ac.						

LOT 8-154		LOT 8: drive		1 story		H:V	Shape		
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom		
plane 1	0.09	64% drive	99.0		30.0 0.020	0.1			
plane 2	0.05	36% street	99.0		28.0 0.082	0.1			
channel					28.0 0.005	0.012	0.3		
total	0.14		0.00005					15	c
			0.03213 ac.						

Junction 5 add front yard

LOT 8-155		LOT 8: rear roof		1 story		H:V	Shape		
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom		
plane 1	0.21	100%	99.0		16.0 0.300	0.1			
plane 2		0%							
channel					72.0 0.005	0.012	0.3		
total	0.21		0.00008						c
			0.0482 ac.						

LOT 8-156		LOT 8: rear yard		1 story		H:V	Shape		
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom		
plane 1	0.07	26%	84.0		10.0 0.062	0.5			
plane 2	0.20	74%	84.0	25	30.0 0.005	0.5			
channel					60.0 0.005	0.5	0		
total	0.27		0.00010					15	t
			0.06197 ac.						

LOT 8-157		LOT 8: right yard		1 story		H:V	Shape		
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom		
plane 1	0.05	18%	84.0		10.0 0.110	0.5			
plane 2	0.23	82%	84.0		25.0 0.005	0.5			
channel					50.0 0.005	0.5	0		
total	0.28		0.00010					14	t
			0.06427 ac.						

Junction 7 add front roof

LOT 8-158		LOT 8: front roof		1 story		H:V	Shape		
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom		
plane 1	0.18	100%	99.0		21.0 0.300	0.1			
plane 2		0%							
channel					51.0 0.005	0.012	0.3		
total	0.18		0.00006						c
			0.04131 ac.						

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LOT 8-159		LOT 8: front yard		1 story		n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope				
plane 1	0.08	13%	84.0	3	20.0 0.100	0.5			
plane 2	0.52	87%	84.0		60.0 0.010	0.5			
channel					80.0 0.020	0.5	0	14	t
total	0.60		0.00022						
			0.13771 ac.						

Junction 5

LOT 8-160		LOT 8: street		1 story		n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope				
plane 1	0.12	52% street	99.0		64.0 0.085	0.1			
plane 2	0.11	48% yard	84.0		15.0 0.500	0.5			
channel					110.0 0.080	0.05	0	4	t
total	0.23		0.00008						
			0.05279 ac.						

Junction 6 add next lot

LOT 7-161		LOT 7: left side yard		2 story		n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope				
plane 1	0.10	12%	84.0		20.0 0.500	0.5			
plane 2	0.73	88%	84.0		15.0 0.065	0.5			
channel					50.0 0.005	0.5	0	15	t
total	0.83		0.00030						
			0.1905 ac.						

Junction 8 add left garage roof

LOT 7-162		LOT 7: left garage roof		2 story		n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope				
plane 1	0.02	100%	99.0		11.0 0.300	0.1			
plane 2		0%							
channel					21.0 0.005	0.012	0.3		C
total	0.02		0.00001						
			0.00459 ac.						

LOT 7-163		LOT 7: left side yard		2 story		n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope				
plane 1	0.16	73%	84.0		20.0 0.500	0.5			
plane 2	0.06	27%	84.0		15.0 0.070	0.5			
channel					40.0 0.005	0.5	0	31	t
total	0.22		0.00008						
			0.05049 ac.						

LOT 7-164		LOT 7: street		2 story		n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope				
plane 1	0.05	100%	99.0		68.0 0.082	0.1			
plane 2		0%							
channel					30.0 0.080	0.05	0	4	t
total	0.05		0.00002						
			0.01148 ac.						

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Junction 9 add right garage roof

LOT 7-165 **LOT 7: right garage roof** **2 story**

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.02	22%	99.0		11.0	0.300	0.1			
plane 2	0.07	78%	99.0		26.0	0.300	0.1			
channel					47.0	0.005	0.012	0.3		
total	0.09		0.00003							C
			0.02066 ac.							

LOT 7-166 **LOT 7: drive** **2 story**

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.06	16%	99.0		30.0	0.050	0.1			
plane 2	0.32	84%	99.0		64.0	0.082	0.1			
channel					20.0	0.080	0.012	0.3		
total	0.38		0.00014							C
			0.08722 ac.							

Junction 11 add front yard

LOT 7-167 **LOT 7: rear roof** **2 story**

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.14	100%	99.0		26.0	0.300	0.1			
plane 2		0%								
channel					52.0	0.005	0.012	0.3		
total	0.14		0.00005							C
			0.03213 ac.							

LOT 7-168 **LOT 7: rear yard** **2 story**

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.87	94%	84.0	6	90.0	0.005	0.5			
plane 2	0.06	6%	84.0		10.0	0.062	0.5			
channel					60.0	0.005	0.5	0	16	t
total	0.93		0.00033							
			0.21345 ac.							

LOT 7-169 **right sideyard** **2 story**

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.05	31%	84.0		10.0	0.095	0.5			
plane 2	0.11	69%	84.0		90.0	0.005	0.5			
channel					60.0	0.005	0.5	0	16	t
total	0.16		0.00006							
			0.03672 ac.							

Junction 10 add front roof

LOT 7-170 **front roof** **2 story**

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.07	100%	99.0		26.0	0.300	0.1			
plane 2		0%								
channel					26.0	0.005	0.012	0.3		
total	0.07		0.00003							C
			0.01607 ac.							

Junction 12

FALLBROOK OAKS
CENTER CANYON AFTER

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WINTON ENGINEERING INC.

LOT 7-171 front yard

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.07	28%	84.0	3	10.0	0.050	0.5			
plane 2	0.18	72%	84.0		36.0	0.010	0.5			
channel					65.0	0.005	0.5	0		
total	0.25		0.00009						16	t
to 152			0.05738 ac.							

LOT 7-172 street

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.13	45% street	99.0		64.0	0.082	0.1			
plane 2	0.16	55% yard	84.0		18.0	0.500	0.5			
channel					82.0	0.080	0.05	0		
total	0.29		0.00010						4	t
			0.06656 ac.							

Junction 12 add next lot

LOT 6-173 left side yard

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.12	33%	84.0		10.0	0.067	0.5			
plane 2	0.24	67%	84.0		20.0	0.500	0.5			
channel					92.0	0.005	0.5	0		
total	0.36		0.00013						31	t
			0.08263 ac.							

LOT 6-174 street

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.05	100%	99.0		64.0	0.082	0.1			
plane 2		0%								
channel					30.0	0.080	0.05	0		
total	0.05		0.00002						4	t
			0.01148 ac.							

LOT 6-175 drive

	A sq. in.	A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.14	58% drive	99.0		35.0	0.075	0.1			
plane 2	0.10	42% street	99.0		64.0	0.082	0.1			
channel					30.0	0.080	0.012	0.3		
total	0.24		0.00009							C
			0.05509 ac.							

Junction 13 add front yard

LOT 6-176 rear roof

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.21	100%	99.0		16.0	0.300	0.1			
plane 2		0%								
channel					72.0	0.005	0.012	0.3		
total	0.21		0.00008							C
			0.0482 ac.							

**FALLBROOK OAKS
CENTER CANYON AFTER**

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WINTON ENGINEERING INC.

LOT 6-177	rear yard	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom
plane 1	0.07	10%	84.0		10.0	0.062	0.5	
plane 2	0.66	90%	84.0	9	65.0	0.005	0.5	
channel					60.0	0.005	0.5	0
total	0.73	0.00026					15	t
		0.16755 ac.						

LOT 6-178	right yard	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom
plane 1	0.06	100%	82.0		15.0	0.063	0.5	
plane 2								
channel					50.0	0.005	0.5	0
total	0.06	0.00002					14	t
		0.01377 ac.						

Junction 14 add front roof

LOT 6-179	front roof	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom
plane 1	0.13	100%	99.0		21.0	0.300	0.1	
plane 2		0%						
channel					51.0	0.005	0.012	0.3
total	0.13	0.00005						c
		0.02984 ac.						

LOT 6-180	front yard	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom
plane 1	0.19	68%	84.0		30.0	0.030	0.500	
plane 2	0.09	32%	84.0	2	15.0	0.005	0.500	
channel					95.0	0.020	0.050	
total	0.28	0.00010					14	t
		0.06427 ac.						

LOT 6-181	street	2 story						
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom
plane 1	0.48	100%	99.0		75.0	0.054	0.1	
plane 2		0%						
channel					70.0	0.050	0.05	0
total	0.48	0.00017					4	t
		0.11017 ac.						

Junction 15 with next lot

LOT 5-182	left side yard	2 story						
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom
plane 1	0.03	30%	84.0	90	5.0	0.500	0.5	
plane 2	0.07	70%	84.0		14.0	0.130	0.5	
channel					50.0	0.005	0.5	0
total	0.10	0.00004					15	t
		0.02295 ac.						

**FALLBROOK OAKS
CENTER CANYON AFTER**

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WINTON ENGINEERING INC.

Junction 16 add left garage roof

LOT 5-183 left garage roof 2 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.02	100%	99.0		11.0	0.300	0.1			
plane 2		0%								
channel										
total	0.02		0.00001		21.0	0.005	0.012	0.3		C
			0.00459 ac.							

LOT 5-184 left side yard 2 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.03	25%	84.0		5.0	0.500	0.5			
plane 2	0.09	75%	84.0		14.0	0.070	0.5			
channel					65.0	0.005	0.5	0	31	t
total	0.12		0.00004							
			0.02754 ac.							

LOT 5-185 street 2 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.08	100%	99.0		64.0	0.054	0.1			
plane 2		0%								
channel					22.0	0.050	0.05	0	4	t
total	0.08		0.00003							
			0.01836 ac.							

LOT 5-186 right garage roof 2 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.02	100%	99.0		11.0	0.300	0.1			
plane 2		0%								
channel					15.0	0.005	0.012	0.3		C
total	0.02		0.00001							
			0.00459 ac.							

LOT 5-187 drive 2 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.05	31% drive	99.0		50.0	0.054	0.1			
plane 2	0.11	69% street	99.0		35.0	0.082	0.1			
channel					20.0	0.005	0.012	0.3		C
total	0.16		0.00006							
			0.03672 ac.							

Junction 17 add front yard

LOT 5-188 rear roof 2 story

	A sq. in.	A sq. mi.	CN _{2,7}	Imperv.	Length,	Slope	n	Bottom	H:V	Shape
plane 1	0.14	100%	99.0		26.0	0.300	0.1			
plane 2		0%								
channel					52.0	0.005	0.012	0.3		C
total	0.14		0.00005							
			0.03213 ac.							

Junction 12

FALLBROOK OAKS CENTER CANYON AFTER

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WINTON ENGINEERING INC.

Junction 18 add front roof

LOT 5-191		front roof		2 story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imperv.	Length, Slope	n	Bottom	H:V	Shape
plane 1	0.07	100%		99.0		26.0	0.300	0.1	
plane 2			0%						
channel					26.0	0.005	0.012	0.3	
total	0.07		0.00003						C
			0.01607 ac.						

Junction 12

LOT 5-192		front yard		2 story					
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom	H:V	Shape
plane 1	0.07	64%	82.0		10.0 0.050	0.5			
plane 2	0.04	36%	82.0	5	16.0 0.005	0.5			
channel					60.0 0.005	0.5	0	16	t
total	0.11	0.00004							
to 152		0.02525 ac.							

LOT 5-193		street		1 story					
	A sq. in.	% A sq. mi.	CN _{2,7}	Imperv.	Length, Slope	n	Bottom	H:V	Shape
plane 1	0.10	100%	99.0		50.0 0.054	0.1			
plane 2									
channel					20.0 0.050	0.05	0	4	t
total	0.10	0.00004			0.02295 ac.				

PIPE 194	LOT 5:	1 story						
A sq. in.	% A sq. mi.	CN _{2.7}	Imperv.	Length, Slope	n	Bottom	H:V	Shape
plane 1								
plane 2								
channel								
total	0.00	0.00000		380.0 0.100 0.013		1.5		C
			0 ac					

Chapter 8 – Results for Existing Conditions – West Canyon

Project: COE 6-24 WEST CANYON BEFORE DEVELOPMENT

Start of Run:	01 Jan 2000 00:00	Basin Model:	Basin 1
End of Run:	02 Jan 2000 00:00	Meteorolic Model:	Met 1
Compute Time	13 Dec 2007 13:24:05	Control Specifications:	Control 1

BEFORE DEVELOPMENT Junction G 281.3 ac. 860.5 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Junction A	0.18636	464.022	01Jan2000, 16:00	3.02
Junction B	0.24395	553.111	01Jan2000, 16:00	3.01
Junction C	0.28198	548.039	01Jan2000, 16:05	3.01
Junction D	0.06792	179.030	01Jan2000, 16:00	3.02
Junction E	0.13367	289.609	01Jan2000, 16:00	3.00
Junction F	0.01775	44.859	01Jan2000, 16:00	3.01
Junction G	0.43946	860.487	01Jan2000, 16:05	3.02
Junction H	0.00472	13.028	01Jan2000, 16:00	3.04
Junction I	0.00574	16.155	01Jan2000, 16:00	3.10
Junction J	0.04709	146.095	01Jan2000, 16:00	3.02
Sub 10	0.02102	72.588	01Jan2000, 16:00	3.03
Sub 11	0.20391	448.701	01Jan2000, 16:00	3.02
Sub 12	0.26736	542.441	01Jan2000, 16:00	3.01
Sub 13	0.28198	548.039	01Jan2000, 16:05	3.01
Sub 14	0.29171	563.215	01Jan2000, 16:05	3.01
Sub 14a	0.00006	0.334	01Jan2000, 16:00	5.38
Sub 14b	0.00466	12.694	01Jan2000, 16:00	3.01
Sub 14c	0.00475	12.557	01Jan2000, 16:00	3.05
Sub 14d	0.00099	3.598	01Jan2000, 16:00	3.31
Sub 14e	0.00591	13.034	01Jan2000, 16:05	3.16
Sub 15	0.02729	68.053	01Jan2000, 16:00	3.04
Sub 16	0.01484	56.252	01Jan2000, 16:00	3.05
Sub 17	0.02579	54.725	01Jan2000, 16:00	2.99
Sub 18	0.09441	238.408	01Jan2000, 16:00	3.02
Sub 19	0.03926	63.706	01Jan2000, 16:05	2.96
Sub 20	0.16534	391.434	01Jan2000, 16:00	3.01
Sub 21	0.00076	2.659	01Jan2000, 16:00	3.03
Sub 22	0.01699	42.200	01Jan2000, 16:00	3.01
Sub 23	0.04004	104.411	01Jan2000, 16:00	3.01
Sub 24a	0.01116	32.393	01Jan2000, 16:00	3.01
Sub 24b	0.02482	55.710	01Jan2000, 16:00	3.00
Sub 24c	0.03554	84.285	01Jan2000, 16:00	3.01

WINTON ENGINEERING INC.

BEFORE DEVELOPMENT Junction G 281.3 ac. 860.5 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Sub 24d	0.04732	116.755	01Jan2000, 16:00	3.02
Sub 24e	0.10754	270.576	01Jan2000, 16:00	3.02
Sub 25a	0.03392	79.492	01Jan2000, 16:05	3.05
Sub 25b	0.03404	78.881	01Jan2000, 16:05	3.05
Sub 25c	0.04709	146.095	01Jan2000, 16:00	3.02
Sub 25d	0.03430	72.850	01Jan2000, 16:05	3.06

**FALLBROOK OAKS
WEST CANYON BEFORE**

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2 November 2007

WINTON ENGINEERING INC.

**WEST EXISTING CANYON GREEN
BEFORE DEVELOPMENT**

SCALE 1in. = 180 ft. SCALE 1 = 100 ft.

SUB. 10

	sq. in.	% sq. mi.	CN _{2.7} Imp Length	Slope	n	Bottom	Side slope	Shape
plane 1	5.79	32%	77.0	180	0.420	0.13		
plane 2	12.30	68%	77.0	250	0.200	0.13		
channel				2000	0.110	0.03	3	4 T
total	18.09		0.02102					
			13.45259 ac.					

Junction A

SUB.11

	sq. in.	% sq. mi.	CN _{2.7} Imp Length	Slope	n	Bottom	Side slope	Shape
plane 1	3.57	24%	77.0	920	0.240	0.13		
plane 2	11.53	76%	77.0	540	0.160	0.13		
channel				980	0.050	0.03	3	4 T
total	15.10		0.01755					
			11.22908 ac.					

Junction B

SUB.12

	sq. in.	% sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape	
plane 1	7.74	38%	77.0	630	0.240	0.13		
plane 2	12.40	62%	77.0	800	0.060	0.13		
channel				590	0.020	0.03	3	4 T
total	20.14		0.02341					
			14.97707 ac.					

SUB 13

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape	
plane 1	33.70	83%	77.0	580	0.166	0.13		
plane 2	7.06	17%	77.0	414	0.240	0.13		
channel				1170	0.060	0.03	3	4 T
total	40.76		0.01462					
			9.355276 ac.					

Junction C

SUB.14

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape	
plane 1	25.50	94%	77.0	506	0.200	0.13		
plane 2	1.63	6%	77.0	180	0.080	0.13		
channel				490	,08	0.03	3	4 T
total	27.13		0.00973					
			6.226904 ac.					

**FALLBROOK OAKS
WEST CANYON BEFORE**

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WINTON ENGINEERING INC.

2 November 2007

Junction D

SUB 14a RECHE ROAD

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.18	100%		99.0	20	0.020	0.1	
plane 2		0%						
channel								
total	0.18		0.00006		90	0.005	0.05	0
								4 t
				0.041314 ac.				

SUB 14b RECHE ROAD

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	9.20	71%		77.0	495	0.190	0.13	
plane 2	3.78	29%		77.0	461	0.230		
channel					660	0.136	0.03	3
total	12.98		0.00466					4 T
				2.979182 ac.				

Junction H

SUB 14c RECHE ROAD

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.09	100%		99.0	20	0.020	0.1	
plane 2		0%						
channel					45	0.005	0.05	3
total	0.09		0.00003					4 t
				0.020657 ac.				

SUB 14d

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	2.45	88%		77.0	262	0.190	0.13	
plane 2	0.32	12%		99.0	20	0.020	0.1	
channel					160	0.005	0.05	0
total	2.77		0.00099					4 t
				0.635773 ac.				

Junction I

SUB 14e

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.48	100%		99.0	20	0.020	0.1	
plane 2		0%						
channel					240	0.005	0.05	0
total	0.48		0.00017					4 t
				0.11017 ac.				

SUB 15

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	6.81	29%		77.0	234	0.210	0.13	
plane 2	16.67	71%		77.0	810	0.160	0.13	
channel					1152	0.130	0.03	3
total	23.48		0.02729					4 T
Junction D				17.46086 ac.				

**FALLBROOK OAKS
WEST CANYON BEFORE**

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2 November 2007

WINTON ENGINEERING INC.

SUB 16

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	11.04	86%	77.0	160 0.310	0.13			
plane 2	1.73	14%	77.0	270 0.280	0.13			
channel				1360 0.140	0.03	3	4	T
total	12.77		0.01484					
			9.496385 ac.					

JUNCTION D

SUB 17

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	10.57	48%	77.0	648 0.14	0.13			
plane 2	11.62	52%	77.0	558 0.160	0.13			
channel				747 0.070	0.03	3	4	T
total	22.19		0.02579					
			16.50155 ac.					

Junction D

SUB. 18

	A sq. ft.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	8.60	38%	77.0	320 0.420	0.13			
plane 2	14.19	62%	77.0	420 0.240	0.13			
channel				1100 0.060	0.03	3	4	T
total	22.79		0.02649					
			16.94774 ac.					

Junction E

SUB. 19

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	22.68	67%	77.0	2000 0.160	0.13			
plane 2	11.10	33%	77.0	630 0.200	0.13			
channel				2475 0.120	0.03	3	0.25	T
total	33.78		0.03926					
			25.12043 ac.					

SUB.20

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.62	2%	77.0	1080 0.210	0.13			
plane 2	26.63	98%	77.0	160 0.160	0.13			
channel				500 0.030	0.03	3	0.25	T
total	27.25		0.03167					
			20.26441 ac.					

Junction A

**FALLBROOK OAKS
WEST CANYON BEFORE**

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WINTON ENGINEERING INC.

SUB.21

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.44	84%	77.0	270	0.280	0.13	
plane 2	0.65	16%	77.0	200	0.250	0.13	
channel				960	0.210	0.03	
total	4.09		0.00475			3	4 T
			3.04152 ac.				

Junction F

SUB.22

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	4.96	34%	77.0	380	0.300	0.13	
plane 2	9.66	66%	77.0	790	0.160	0.13	
channel				1010	0.210	0.03	
total	14.62		0.01699			3	4 T
			10.87213 ac.				

SUB.23

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	5.41	27%	77.0	360	0.140	0.13	
plane 2	14.29	73%	77.0	396	0.250	0.13	
channel				1134	0.080	0.03	
total	19.70		0.02290			3	4 T
			14.64987 ac.				

SUB.24-a

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.66	38%	77.0	324	0.150	0.13	
plane 2	5.94	62%	77.0	306	0.160	0.13	
channel				1332	0.100	0.03	
total	9.60		0.01116			3	4 T
			7.139021 ac.				

SUB.24-b

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	11.75	89%	77.0	360	0.140	0.13	
plane 2	1.43	11%	77.0	360	0.280	0.13	
channel				1899	0.090	0.03	
total	13.18		0.01532			3	4 T
			9.801281 ac.				

SUB.24-c

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	5.60	61%	77.0	252	0.200	0.13	
plane 2	3.62	39%	77.0	198	0.250	0.13	
channel				1602	0.160	0.03	
total	9.22		0.01072			3	4 T
			6.856435 ac.				

**FALLBROOK OAKS
WEST CANYON BEFORE**

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WINTON ENGINEERING INC.

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SUB.24-d

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	2.18	21%	77.0	72 0.350	0.13			
plane 2	7.96	79%	77.0	324 0.230	0.13			
channel				738 0.070	0.03	3		
total	10.14		0.01178				4 T	
			7.540591 ac.					

SUB.24-e

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.66	15%	77.0	72 0.350	0.13			
plane 2	9.64	85%	77.0	432 0.280	0.13			
channel				1080 0.080	0.03	3		
total	11.30		0.01313				4 T	
			8.403222 ac.					

Junction G

SUB.25-a

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.57	2%	99.0	31 0.160	0.1			
plane 2	28.62	98%	77.0	540 0.320	0.13			
channel				2475 0.160	0.05			
total	29.19		0.03392				4 t	
			21.70709 ac.					

SUB.25-b RECHE ROAD

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.10	100%	99.0	31 0.160	0.1			
plane 2		0%						
channel				1080 0.160	0.05			
total	0.10		0.00012				4 t	
			0.074365 ac.					

Junction J

SUB.25-c

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	10.94	27%	77.0	234 0.320	0.13			
plane 2	29.58	73%	77.0	540 0.320	0.13			
channel				1602 0.160	0.03	3		
total	40.52		0.04709				4 T	
			30.13262 ac.					

SUB.25-d RECHE ROAD

	A sq. in.	% A sq. mi.	CN _{2,7} Imp	Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.22	100%	99.0	31 0.160	0.1			
plane 2		0%						
channel				963 0.160	0.05			
total	0.22		0.00026				4 T	
			0.163603 ac.					

Junction G

Chapter 9 – Results for Developed Conditions – West Canyon

Project: COE 6-24 WEST CANYON AFTER DEVELOPMENT

Start of Run:	01 Jan 2000 00:00	Basin Model:	Basin 1
End of Run:	02 Jan 2000 00:00	Meteoric Model:	Met 1
Compute Time	12 Dec 2007 14:51:45	Control Specifications:	Control 1

AFTER DEVELOPMENT Junction G 281.3 ac. 853.8 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
DITCH 150	0.00085	2.167	01Jan2000, 16:05	3.67
DITCH 157	0.00007	0.263	01Jan2000, 16:05	3.71
DITCH 160	0.01517	27.716	01Jan2000, 16:00	4.03
Junction 1	0.00019	0.889	01Jan2000, 16:00	4.93
Junction-10	0.00318	6.373	01Jan2000, 16:00	4.05
Junction-11	0.00007	0.335	01Jan2000, 16:00	4.43
Junction-12	0.00420	7.807	01Jan2000, 16:05	3.99
Junction-13	0.00084	1.351	01Jan2000, 16:10	3.78
Junction-14	0.00435	8.149	01Jan2000, 16:05	4.01
Junction-15	0.00007	0.334	01Jan2000, 16:00	4.43
Junction-16	0.00490	9.013	01Jan2000, 16:05	4.01
Junction-17	0.00044	0.919	01Jan2000, 16:10	3.95
Junction-18	0.00978	18.736	01Jan2000, 16:00	3.97
Junction-19	0.00087	1.357	01Jan2000, 16:20	3.90
Junction 2	0.00099	1.971	01Jan2000, 16:10	4.00
Junction-20	0.00058	1.241	01Jan2000, 16:10	3.73
Junction-21	0.00093	1.382	01Jan2000, 16:20	3.90
Junction-22	0.00007	0.252	01Jan2000, 16:00	4.41
Junction-23	0.00109	1.771	01Jan2000, 16:00	3.95
Junction-24	0.00025	0.702	01Jan2000, 16:05	4.02
Junction-25	0.00178	3.317	01Jan2000, 16:00	4.00
Junction-26	0.00245	4.598	01Jan2000, 16:00	3.96
Junction-27	0.00040	0.846	01Jan2000, 16:10	3.77
Junction-28	0.00275	5.562	01Jan2000, 16:00	3.99
Junction-29	0.00007	0.297	01Jan2000, 16:00	4.42
Junction 3	0.00134	2.733	01Jan2000, 16:00	3.97
Junction-30	0.00311	6.178	01Jan2000, 16:00	3.98
Junction-31	0.00023	0.511	01Jan2000, 16:10	3.80
Junction-32	0.00104	1.730	01Jan2000, 16:00	3.93
Junction-33	0.00029	0.514	01Jan2000, 16:05	3.82
Junction-34	0.00142	3.218	01Jan2000, 16:00	4.05
Junction-35	0.00196	3.571	01Jan2000, 16:05	4.01

AFTER DEVELOPMENT Junction G 281.3 ac. 853.8 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
Junction-36	0.00017	0.368	01Jan2000, 16:00	3.98
Junction-37	0.00227	4.021	01Jan2000, 16:05	4.02
Junction-38	0.00021	0.442	01Jan2000, 16:10	3.80
Junction-39	0.00298	5.182	01Jan2000, 16:05	4.02
Junction-4	0.00005	0.241	01Jan2000, 16:00	4.71
Junction-40	0.01446	27.987	01Jan2000, 16:00	4.00
Junction-41	0.00030	0.530	01Jan2000, 16:15	3.78
Junction-42	0.01517	29.186	01Jan2000, 16:00	4.03
Junction-43	0.00049	1.687	01Jan2000, 16:00	4.76
Junction-45	0.01319	25.847	01Jan2000, 16:00	4.00
Junction-5	0.00194	3.799	01Jan2000, 16:05	3.98
Junction-6	0.00047	0.981	01Jan2000, 16:05	3.94
Junction-7	0.00208	4.068	01Jan2000, 16:05	4.00
Junction-8	0.00297	5.923	01Jan2000, 16:05	4.02
Junction-9	0.00067	1.536	01Jan2000, 16:05	4.03
Junction A	0.18636	464.022	01Jan2000, 16:00	3.02
Junction B	0.24395	553.111	01Jan2000, 16:00	3.01
Junction C	0.27312	526.112	01Jan2000, 16:05	3.01
Junction D	0.06792	179.030	01Jan2000, 16:00	3.02
Junction E	0.13367	289.609	01Jan2000, 16:00	3.00
Junction F	0.01775	44.859	01Jan2000, 16:00	3.01
Junction G	0.43975	853.791	01Jan2000, 16:05	3.06
Junction J	0.04709	146.095	01Jan2000, 16:00	3.02
LOT 10-130	0.00003	0.167	01Jan2000, 16:00	5.38
LOT 10-26	0.00005	0.132	01Jan2000, 16:05	3.69
LOT 10-27	0.00006	0.175	01Jan2000, 16:00	3.97
LOT 10-28	0.00011	0.448	01Jan2000, 16:00	4.62
LOT 10-29	0.00008	0.440	01Jan2000, 16:00	5.37
LOT 10-30	0.00039	1.233	01Jan2000, 16:05	4.27
LOT 10-31	0.00092	1.929	01Jan2000, 16:10	3.90
LOT 10-32	0.00007	0.385	01Jan2000, 16:00	5.37
LOT 10-33	0.00121	2.385	01Jan2000, 16:05	3.95
LOT 10-34	0.00122	2.392	01Jan2000, 16:05	3.96
LOT 1-104	0.00004	0.130	01Jan2000, 16:00	3.70
LOT 1-105	0.00003	0.167	01Jan2000, 16:00	5.38
LOT 1-106	0.00014	0.402	01Jan2000, 16:05	4.05
LOT 1-107	0.00279	5.763	01Jan2000, 16:00	4.01
LOT 1-108	0.00001	0.056	01Jan2000, 16:00	5.38

WINTON ENGINEERING INC.

AFTER DEVELOPMENT Junction G 281.3 ac. 853.8 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
LOT 1-109	0.00018	0.478	01Jan2000, 16:05	3.76
LOT 1-110	0.00022	0.505	01Jan2000, 16:10	3.73
LOT 1-111	0.00001	0.055	01Jan2000, 16:00	5.38
LOT 1-112	0.00032	0.541	01Jan2000, 16:15	3.75
LOT 1-113	0.00330	6.759	01Jan2000, 16:00	4.04
LOT 11-35	0.00002	0.074	01Jan2000, 16:00	3.71
LOT 11-36	0.00003	0.167	01Jan2000, 16:00	5.38
LOT 11-37	0.00012	0.378	01Jan2000, 16:00	4.11
LOT 11-38	0.00135	2.730	01Jan2000, 16:00	3.98
LOT 11-39	0.00139	2.912	01Jan2000, 16:00	4.02
LOT 11-40	0.00005	0.279	01Jan2000, 16:00	5.39
LOT 11-41	0.00024	0.665	01Jan2000, 16:05	4.01
LOT 11-42	0.00044	0.954	01Jan2000, 16:05	3.84
LOT 11-43	0.00003	0.168	01Jan2000, 16:00	5.38
LOT 11-44	0.00055	1.050	01Jan2000, 16:05	3.88
LOT 11-45	0.00198	3.803	01Jan2000, 16:05	4.01
LOT 12-46	0.00010	0.285	01Jan2000, 16:00	3.71
LOT 12-47	0.00209	4.065	01Jan2000, 16:05	4.00
LOT 12-48	0.00215	4.118	01Jan2000, 16:05	4.04
LOT 12-49	0.00008	0.440	01Jan2000, 16:00	5.37
LOT 12-50	0.00060	1.474	01Jan2000, 16:05	3.87
LOT 12-52	0.00007	0.385	01Jan2000, 16:00	5.37
LOT 12-53	0.00082	1.806	01Jan2000, 16:05	3.97
LOT 12-54	0.00307	6.055	01Jan2000, 16:00	4.04
LOT 13-55	0.00004	0.168	01Jan2000, 16:00	3.72
LOT 13-56	0.00003	0.167	01Jan2000, 16:00	5.38
LOT 13-57	0.00011	0.323	01Jan2000, 16:05	4.15
LOT 13-58	0.00319	6.403	01Jan2000, 16:00	4.05
LOT 13-59	0.00322	6.529	01Jan2000, 16:00	4.06
LOT 13-60	0.00005	0.275	01Jan2000, 16:00	5.36
LOT 13-61	0.00074	1.391	01Jan2000, 16:05	3.73
LOT 13-62	0.00081	1.333	01Jan2000, 16:10	3.72
LOT 13-63	0.00003	0.168	01Jan2000, 16:00	5.38
LOT 13-64	0.00098	1.507	01Jan2000, 16:10	3.75
LOT 13-65	0.00424	7.826	01Jan2000, 16:05	4.00
LOT 14-66	0.00004	0.168	01Jan2000, 16:00	3.72
LOT 14-67	0.00003	0.166	01Jan2000, 16:00	5.38
LOT 14-68	0.00011	0.322	01Jan2000, 16:05	4.15

AFTER DEVELOPMENT Junction G 281.3 ac. 853.8 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
LOT 14-69	0.00436	8.152	01Jan2000, 16:05	4.01
LOT 14-70	0.00439	8.170	01Jan2000, 16:05	4.02
LOT 14-71	0.00005	0.279	01Jan2000, 16:00	5.39
LOT 14-72	0.00036	0.987	01Jan2000, 16:05	3.89
LOT 14-73	0.00041	0.901	01Jan2000, 16:10	3.85
LOT 14-74	0.00003	0.167	01Jan2000, 16:00	5.38
LOT 14-75	0.00051	0.944	01Jan2000, 16:15	3.90
LOT 14-76	0.00594	12.189	01Jan2000, 16:00	3.95
LOT 15-114	0.00014	0.361	01Jan2000, 16:05	3.70
LOT 15-115	0.00033	0.766	01Jan2000, 16:00	3.69
LOT 15-116	0.00038	0.833	01Jan2000, 16:05	3.67
LOT 15-117	0.00045	0.937	01Jan2000, 16:00	3.94
LOT 15-118	0.00052	1.308	01Jan2000, 16:00	4.13
LOT 15-119	0.00002	0.110	01Jan2000, 16:00	5.37
LOT 15-120	0.00011	0.269	01Jan2000, 16:10	3.98
LOT 15-121	0.00028	0.505	01Jan2000, 16:05	3.77
LOT 15-122	0.00001	0.055	01Jan2000, 16:00	5.37
LOT 15-123	0.00047	0.870	01Jan2000, 16:05	3.75
LOT 15-124	0.00052	0.862	01Jan2000, 16:10	3.73
LOT 15-125	0.00112	2.074	01Jan2000, 16:00	3.99
LOT 15-126	0.00127	2.652	01Jan2000, 16:00	4.03
LOT 18-147	0.01349	26.113	01Jan2000, 16:00	4.01
LOT 18-148	0.00067	2.365	01Jan2000, 16:00	3.69
LOT 18-149	0.00018	0.324	01Jan2000, 16:05	3.67
LOT 18-151	0.01439	27.908	01Jan2000, 16:00	4.00
LOT 18-152	0.00002	0.110	01Jan2000, 16:00	5.37
LOT 18-153	0.00027	0.523	01Jan2000, 16:10	3.75
LOT 18-154	0.00029	0.526	01Jan2000, 16:15	3.73
LOT 18-155	0.00001	0.055	01Jan2000, 16:00	5.37
LOT 18-156	0.00007	0.294	01Jan2000, 16:00	3.73
LOT 18-158	0.01483	27.852	01Jan2000, 16:00	4.00
LOT 18-161	0.00017	0.580	01Jan2000, 16:00	3.70
LOT 18-162	0.00032	1.107	01Jan2000, 16:00	5.33
LOT 18-163	0.00060	1.979	01Jan2000, 16:00	4.73
LOT 18-164	0.00085	2.872	01Jan2000, 16:00	4.60
LOT 18-165	0.00095	2.952	01Jan2000, 16:00	4.69
LOT 18-166	0.00105	3.035	01Jan2000, 16:00	4.75
LOT 18-167	0.00124	3.360	01Jan2000, 16:00	4.78

AFTER DEVELOPMENT Junction G 281.3 ac. 853.8 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
LOT 18-168	0.00005	0.279	01Jan2000, 16:00	5.38
LOT 18-169	0.00020	1.097	01Jan2000, 16:00	5.38
LOT 18-170	0.00027	1.355	01Jan2000, 16:00	5.39
LOT 18-171	0.00034	1.536	01Jan2000, 16:00	5.39
LOT 19-127	0.00015	0.566	01Jan2000, 16:00	4.28
LOT 19-128	0.00151	2.802	01Jan2000, 16:05	4.09
LOT 19-129	0.00014	0.239	01Jan2000, 16:05	3.67
LOT 19-131	0.00043	0.775	01Jan2000, 16:05	3.75
LOT 19-132	0.00045	0.769	01Jan2000, 16:05	3.75
LOT 19-133	0.00202	3.622	01Jan2000, 16:05	4.05
LOT 19-134	0.00001	0.056	01Jan2000, 16:00	5.38
LOT 19-135	0.00018	0.460	01Jan2000, 16:05	3.75
LOT 19-136	0.00020	0.436	01Jan2000, 16:10	3.72
LOT 19-137	0.00001	0.055	01Jan2000, 16:00	5.37
LOT 19-138	0.00024	0.449	01Jan2000, 16:10	3.79
LOT 19-139	0.00025	0.438	01Jan2000, 16:10	3.78
LOT 19-140	0.00239	4.282	01Jan2000, 16:00	4.06
LOT 19-141	0.00268	4.684	01Jan2000, 16:05	4.06
LOT 19-142	0.00030	0.536	01Jan2000, 16:10	3.65
LOT 19-143	0.00321	5.625	01Jan2000, 16:05	4.02
LOT 19-144	0.00384	6.884	01Jan2000, 16:05	4.00
LOT 19-145	0.00989	19.088	01Jan2000, 16:00	3.99
LOT 19-146	0.01344	26.318	01Jan2000, 16:00	4.01
LOT 2-100	0.00039	0.840	01Jan2000, 16:10	3.73
LOT 2-102	0.00062	1.064	01Jan2000, 16:10	3.75
LOT 2-103	0.00261	5.253	01Jan2000, 16:00	3.98
LOT 2-96	0.00027	0.523	01Jan2000, 16:05	3.67
LOT 2-97	0.00183	3.571	01Jan2000, 16:00	4.04
LOT 2-98	0.00002	0.110	01Jan2000, 16:00	5.37
LOT 2-99	0.00033	0.803	01Jan2000, 16:05	3.76
LOT 3-101	0.00001	0.055	01Jan2000, 16:00	5.37
LOT 3-86	0.00004	0.112	01Jan2000, 16:05	3.69
LOT 3-87	0.00003	0.167	01Jan2000, 16:00	5.38
LOT 3-88	0.00005	0.126	01Jan2000, 16:05	3.68
LOT 3-89	0.00098	1.557	01Jan2000, 16:00	3.98
LOT 3-90	0.00005	0.279	01Jan2000, 16:00	5.38
LOT 3-91	0.00021	0.676	01Jan2000, 16:05	4.07
LOT 3-92	0.00025	0.702	01Jan2000, 16:05	4.02

WINTON ENGINEERING INC.

AFTER DEVELOPMENT Junction G 281.3 ac. 853.8 cfs

Hydrologic Element	Drainage Area sqm	Peak Discharge cfs	Time of Peak hours & minutes	Volume in.
LOT 3-93	0.00001	0.055	01Jan2000, 16:00	5.37
LOT 3-94	0.00011	0.293	01Jan2000, 16:05	3.68
LOT 3-95	0.00150	2.846	01Jan2000, 16:00	4.05
LOT 4-77	0.00007	0.140	01Jan2000, 16:05	3.68
LOT 4-78	0.00008	0.167	01Jan2000, 16:00	3.90
LOT 4-79	0.00018	0.710	01Jan2000, 16:00	4.73
LOT 4-80	0.00002	0.103	01Jan2000, 16:00	5.35
LOT 4-81	0.00053	1.222	01Jan2000, 16:05	3.71
LOT 4-82	0.00057	1.235	01Jan2000, 16:10	3.70
LOT 4-83	0.00001	0.055	01Jan2000, 16:00	5.37
LOT 4-84	0.00069	1.248	01Jan2000, 16:20	3.68
LOT 4-85	0.00088	1.353	01Jan2000, 16:20	3.92
PIPE 159	0.01483	27.650	01Jan2000, 16:00	4.00
Sub 10	0.02102	72.588	01Jan2000, 16:00	3.03
Sub 11	0.20391	448.701	01Jan2000, 16:00	3.02
Sub 12	0.26736	542.441	01Jan2000, 16:00	3.01
Sub 13	0.27312	526.112	01Jan2000, 16:05	3.01
Sub 14	0.27622	527.080	01Jan2000, 16:05	3.01
Sub 15	0.02729	68.053	01Jan2000, 16:00	3.04
Sub 16	0.01484	56.252	01Jan2000, 16:00	3.05
Sub 17	0.02579	54.725	01Jan2000, 16:00	2.99
Sub 18	0.09441	238.408	01Jan2000, 16:00	3.02
Sub 19	0.03926	63.706	01Jan2000, 16:05	2.96
Sub 20	0.16534	391.434	01Jan2000, 16:00	3.01
Sub 21	0.00076	2.659	01Jan2000, 16:00	3.03
Sub 22	0.01699	42.200	01Jan2000, 16:00	3.01
Sub 23	0.04004	104.411	01Jan2000, 16:00	3.01
Sub 24a	0.01116	32.393	01Jan2000, 16:00	3.01
Sub 24b	0.02482	55.710	01Jan2000, 16:00	3.00
Sub 24c	0.03554	84.285	01Jan2000, 16:00	3.01
Sub 24d	0.04732	116.755	01Jan2000, 16:00	3.02
Sub 24e	0.10754	270.576	01Jan2000, 16:00	3.02
Sub 25a	0.03920	91.336	01Jan2000, 16:00	3.05
Sub 25b	0.03932	91.342	01Jan2000, 16:05	3.05
Sub 25c	0.04709	146.095	01Jan2000, 16:00	3.02
Sub 25d	0.03958	85.038	01Jan2000, 16:05	3.06

**FALLBROOK OAKS
WEST CANYON AFTER**

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B-1958

2 November 2007

WINTON ENGINEERING INC.

**WEST EXISTING CANYON GREEN
AFTER DEVELOPMENT**

SCALE 1in. =	180 ft.	SCALE 1 =	100 ft.
		SCALE 1 =	50 ft.

SUB. 10

	sq. in.	% sq. mi.	CN _{2,7} Imp Length	Slope	n	Bottom	Side slope	Shape
plane 1	5.79	32%	77.0	180 0.420	0.13			
plane 2	12.30	68%	77.0	250 0.200	0.13			
channel				2000 0.110	0.03	3	4	T
total	18.09		0.02102					
			13.45259 ac.					

Junction A

SUB.11

	sq. in.	% sq. mi.	CN _{2,7} Impv. Length	Slope	n	Bottom	Side slope	Shape
plane 1	3.57	24%	77.0	920 0.240	0.13			
plane 2	11.53	76%	77.0	540 0.160	0.13			
channel				980 0.050	0.03	3	4	T
total	15.10		0.01755					
			11.22908 ac.					

Junction B

SUB.12

	sq. in.	% sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape	
plane 1	7.74	38%	77.0	630 0.240	0.13			
plane 2	12.40	62%	77.0	800 0.060	0.13			
channel				590 0.020	0.03	3	4	T
total	20.14		0.02341					
			14.97707 ac.					

SUB 13

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape	
plane 1	9.00	56%	77.0	60 0.130	0.13			
plane 2	7.06	44%	77.0	414 0.240	0.13			
channel				1170 0.060	0.03	3	4	T
total	16.06		0.00576					
			3.686107 ac.					

Junction C

SUB.14

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape	
plane 1	7.00	81%	77.0	80 0.130	0.13			
plane 2	1.63	19%	77.0	180 0.080	0.13			
channel				490 ,08	0.03	3	4 T	
total	8.63		0.00310					
			1.980766 ac.					

Junction D

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SUB 15

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	6.81	29%	77.0	234	0.210	0.13	
plane 2	16.67	71%	77.0	810	0.160	0.13	
channel				1152	0.130	0.03	3
total	23.48		0.02729				4
Junction D			17.46086 ac.				T

SUB 16

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	11.04	86%	77.0	160	0.310	0.13	
plane 2	1.73	14%	77.0	270	0.280	0.13	
channel				1360	0.140	0.03	3
total	12.77		0.01484				4
			9.496385 ac.				T

JUNCTION D

SUB 17

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	10.57	48%	77.0	648	0.14	0.13	
plane 2	11.62	52%	77.0	558	0.160	0.13	
channel				747	0.070	0.03	3
total	22.19		0.02579				4
			16.50155 ac.				T

Junction D

SUB. 18

	A sq. ft.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	8.60	38%	77.0	320	0.420	0.13	
plane 2	14.19	62%	77.0	420	0.240	0.13	
channel				1100	0.060	0.03	3
total	22.79		0.02649				4
			16.94774 ac.				T

Junction E

SUB. 19

	A sq. in.	% A sq. mi.	CN _{2.7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	22.68	67%	77.0	2000	0.160	0.13	
plane 2	11.10	33%	77.0	630	0.200	0.13	
channel				2475	0.120	0.03	3
total	33.78		0.03926				0.25
			25.12043 ac.				T

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SUB.20

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.62	2%		77.0	1080	0.210	0.13	
plane 2	26.63	98%		77.0	160	0.160	0.13	
channel					500	0.030	0.03	
total	27.25		0.03167				3	0.25 T
			20.26441 ac.					

Junction A

SUB.21

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.44	84%		77.0	270	0.280	0.13	
plane 2	0.65	16%		77.0	200	0.250	0.13	
channel					960	0.210	0.03	
total	4.09		0.00475				3	4 T
			3.04152 ac.					

Junction F

SUB.22

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	4.96	34%		77.0	380	0.300	0.13	
plane 2	9.66	66%		77.0	790	0.160	0.13	
channel					1010	0.210	0.03	
total	14.62		0.01699				3	4 T
			10.87213 ac.					

SUB.23

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	5.41	27%		77.0	360	0.140	0.13	
plane 2	14.29	73%		77.0	396	0.250	0.13	
channel					1134	0.080	0.03	
total	19.70		0.02290				3	4 T
			14.64987 ac.					

SUB.24-a

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.66	38%		77.0	324	0.150	0.13	
plane 2	5.94	62%		77.0	306	0.160	0.13	
channel					1332	0.100	0.03	
total	9.60		0.01116				3	4 T
			7.139021 ac.					

SUB.24-b

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	11.75	89%		77.0	360	0.140	0.13	
plane 2	1.43	11%		77.0	360	0.280	0.13	
channel					1899	0.090	0.03	
total	13.18		0.01532				3	4 T
			9.801281 ac.					

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SUB.24-c

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	5.60	61%	77.0	252	0.200	0.13			
plane 2	3.62	39%	77.0	198	0.250	0.13			
channel				1602	0.160	0.03	3		
total	9.22		0.01072					4 T	
			6.856435 ac.						

SUB.24-d

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	2.18	21%	77.0	72	0.350	0.13			
plane 2	7.96	79%	77.0	324	0.230	0.13			
channel				738	0.070	0.03	3		
total	10.14		0.01178					4 T	
			7.540591 ac.						

SUB.24-e

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	1.66	15%	77.0	72	0.350	0.13			
plane 2	9.64	85%	77.0	432	0.280	0.13			
channel				1080	0.080	0.03	3		
total	11.30		0.01313					4 T	
			8.403222 ac.						

Junction G

SUB.25-a

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	0.57	2%	99.0	31	0.160	0.1			
plane 2	28.62	98%	77.0	540	0.320	0.13			
channel				2475	0.160	0.05			
total	29.19		0.03392					4 t	
			21.70709 ac.						

SUB.25-b RECHE ROAD

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	0.10	100%	99.0	31	0.160	0.1			
plane 2		0%							
channel				1080	0.160	0.05			
total	0.10		0.00012					4 t	
			0.074365 ac.						

Junction J

SUB.25-c

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length,	Slope	n	Bottom	Side slope	Shape
plane 1	10.94	27%	77.0	234	0.320	0.13			
plane 2	29.58	73%	77.0	540	0.320	0.13			
channel				1602	0.160	0.03	3		
total	40.52		0.04709					4 T	
			30.13262 ac.						

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SUB.25-d RECHE ROAD

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.22	100%	99.0	31	0.160	0.1	
plane 2		0%					
channel				963	0.160	0.05	3
total	0.22		0.00026				4 T
			0.163603 ac.				

LOT 10-26 Right Side Yard 1 Story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.13	100%	84.0	15	0.230	0.5	
plane 2		0%					
channel				85	0.010	0.5	4 t
total	0.13		0.00005				
			0.029838 ac.				

LOT 10-27 Street 1 Story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.02	100%	99.0	14	0.020	0.1	
plane 2		0%					
channel				15	0.005	0.05	4 t
total	0.02		0.00001				
			0.00459 ac.				

LOT 10-28 Drive 1 Story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.10	67% drive	99.0	35	0.050	0.1	
plane 2	0.05	33% street	99.0	16	0.020	0.1	
channel				30	0.005	0.012	0.3
total	0.15		0.00005				C
			0.034428 ac.				

Junction 1 with front yard

LOT 10-29 Rear Roof 1 Story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.23	100%	99.0	16	0.300	0.1	
plane 2		0%					
channel				72	0.005	0.012	C
total	0.23		0.00008				
			0.05279 ac.				

LOT 10-30 Rear Yard 1 Story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.09	16%	84.0	10	0.210	0.5	
plane 2	0.48	84%	84.0	57	0.010	0.5	
channel				90	0.010	0.5	4 t
total	0.57		0.00020				
			0.130827 ac.				

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LOT 10-31		Left Side Yard	1 Story	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.05	3%		84.0		10 0.160	0.5			
plane 2	1.42	97%		84.0		90 0.010	0.5			
channel						40 0.010	0.5			4 t
total	1.47		0.00053							
			0.337396 ac.							

Junction 2

LOT 10-32		Front Roof	1 Story	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.20	100%		99.0		16 0.300	0.1			
plane 2		0%								
channel						60 0.005	0.012			C
total	0.20		0.00007							
			0.045904 ac.							

LOT 10-33		Front Yard	1 Story	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.04	6%		84.0		27 0.050	0.5			
plane 2	0.58	94%		84.0		50 0.010	0.5			
channel						80 0.010	0.5			C
total	0.62		0.00022							
			0.142303 ac.							

LOT 10-34		Street	1 Story	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.02	100%		99.0		14 0.020	0.1			
plane 2		0%								
channel						10 0.005	0.05			4 t
total	0.02		0.00001							
			0.00459 ac.							

Junction 3 with lot 11

LOT 11-35		Right Side Yard	2 Story	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.06	100%		84.0		15 0.230	0.5			
plane 2		0%								
channel						40 0.010	0.5			4 t
total	0.06		0.00002							
			0.013771 ac.							

Junction 4 with Front Roof

LOT 11-36		Front Roof	2 Story	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.09	100%		99.0		11 0.300	0.1			
plane 2		0%								
channel						26 0.005	0.012			C
total	0.09		0.00003							

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0.020657 ac.

LOT 11-37		Right Side Yard	2 Story				
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.06	100%	84.0	15	0.230	0.5	
plane 2		0%					
channel				50	0.010	0.5	
total	0.06	0.00002					4 t
		0.013771 ac.					

LOT 11-38		Street	2 Story				
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.02	100%	99.0	14	0.020	0.1	
plane 2		0%					
channel				15	0.005	0.05	
total	0.02	0.00001					4 t
		0.00459 ac.					

LOT 11-39		Drive	2 Story				
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.06	60%	99.0	30	0.050	0.1	
plane 2	0.04	40%	99.0	14	0.020	0.1	
channel				25	0.005	0.012	0.3
total	0.10	0.00004					C
		0.022952 ac.					

Junction 5 with front yard

LOT 11-40		Rear Roof	2 Story				
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.14	100%	99.0	26	0.300	0.1	
plane 2		0%					
channel				52	0.010	0.012	
total	0.14	0.00005					C
		0.032133 ac.					

LOT 11-41		Rear Yard	2 Story				
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.06	11%	84.0	10	0.210	0.5	
plane 2	0.47	89%	84.0	70	0.010	0.5	
channel				70	0.010	0.5	
total	0.53	0.00019					4 t
		0.121646 ac.					

LOT 11-42		Left Side Yard	2 Story				
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.04	7%	84.0	10	0.200	0.5	
plane 2	0.52	93%	84.0	60	0.010	0.5	
channel				50	0.010	0.5	
total	0.56	0.00020					4 t
		0.128532 ac.					

Junction 6 with Front Roof

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LOT 11-43		Front Roof		2 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.09	100%	99.0	11	0.300	0.1			
plane 2		0%							
channel				50	0.005	0.012	0.3		C
total	0.09	0.00003	0.020657 ac.						

LOT 11-44		Front Yard		2 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.11	50%	84.0	15	0.050	0.5			
plane 2	0.11	50%	84.0	15	0.010	0.5			
channel				70	0.010	0.5			4 t
total	0.22	0.00008	0.050495 ac.						

LOT 11-45		Street		2 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.12	100%	99.0	14	0.020	0.1			
plane 2		0%							
channel				55	0.005	0.05			4 t
total	0.12	0.00004	0.027543 ac.						

Junction 7 with lot 12

LOT 12-46		Right Side Yard		1 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.05	18%	84.0	5	0.500	0.5			
plane 2	0.23	82%		18	0.200	0.5			
channel				85	0.010	0.5			4 t
total	0.28	0.00010	0.064266 ac.						

LOT 12-47		Street		1 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.03	100%	99.0	16	0.020	0.1			
plane 2		0%							
channel				18	0.005	0.05			4 t
total	0.03	0.00001	0.006886 ac.						

LOT 12-48		Drive		1 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.11	69% drive	99.0	35	0.050	0.1			
plane 2	0.05	31% street	99.0	66	0.082	0.1			
channel				30	0.080	0.012	0.3		C
total	0.16	0.00006	0.036723 ac.						

Junction 8 with front yard

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LOT 12-49		Rear Roof	1 Story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.23	100%	99.0	16 0.300	0.1			
plane 2		0%						
channel				72 0.005	0.012			C
total	0.23	0.00008						
		0.05279 ac.						

LOT 12-50		Rear Yard	1 Story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.09	6%	84.0	10 0.210	0.5			
plane 2	1.36	94%	84.0	75 0.010	0.5			
channel				90 0.010	0.5			4 t
total	1.45	0.00052						
		0.332805 ac.						

LOT 12-50		Left Side Yard	1 Story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.05	9%	84.0	10 0.160	0.5			
plane 2	0.50	91%	84.0	90 0.010	0.5			
channel				40 0.010	0.5			4 t
total	0.55	0.00020						
		0.126237 ac.						

Junction 9 with Front Roof

LOT 12-52		Front Roof	1 Story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.20	100%	99.0	16 0.300	0.1			
plane 2		0%						
channel				60 0.005	0.012			C
total	0.20	0.00007						
		0.045904 ac.						

LOT 12-53		Front Yard	1 Story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.11	26%	84.0	10 0.050	0.5			
plane 2	0.32	74%	84.0	50 0.010	0.5			
channel				80 0.010	0.5			C
total	0.43	0.00015						
		0.098694 ac.						

LOT 12-54		Street	1 Story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.17	61%	99.0	66 0.082	0.1			
plane 2	0.11	39%	84.0	10 0.500	0.5			
channel				105 0.080	0.05			4 t
total	0.28	0.00010						
		0.064266 ac.						

Junction 10 with Lot 13

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LOT 13-55		Right Side Yard		2 Story		n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.06	60%	84.0	15 0.500	0.5	
plane 2	0.04	40%	84.0	10 0.200	0.5	
channel				40 0.010	0.5	
total	0.10	0.00004				
		0.022952 ac.				4 t

Junction 11 with Front Roof

LOT 13-56		Front Roof		2 Story		n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.09	100%	99.0	11 0.300	0.1	
plane 2		0%				
channel				26 0.005	0.012	
total	0.09	0.00003				
		0.020657 ac.				C

LOT 13-57		Right Side Yard		2 Story		n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.07	58%	84.0	15 0.500	0.5	
plane 2	0.05	42%	84.0	10 0.230	0.5	
channel				45 0.010	0.5	
total	0.12	0.00004				
		0.027543 ac.				4 t

LOT 13-58		Street		2 Story		n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.02	100%	99.0	66 0.082	0.1	
plane 2		0%				
channel				10 0.080	0.05	
total	0.02	0.00001				
		0.00459 ac.				4 t

LOT 13-59		Drive		2 Story		n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.06	67%	99.0	30 0.050	0.1	
plane 2	0.03	33%	99.0	66 0.082	0.1	
channel				20 0.080	0.012	
total	0.09	0.00003			0.3	
		0.020657 ac.				C

Junction 12 with front yard

LOT 13-60		Rear Roof		2 Story		n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.14	100%	99.0	26 0.300	0.1	
plane 2		0%				
channel				52 0.005	0.012	
total	0.14	0.00005				
		0.032133 ac.				C

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LOT 13-61		Rear Yard	2 Story			
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n
plane 1	0.06	3%	84.0	10	0.210	0.5
plane 2	1.85	97%	84.0	125	0.010	0.5
channel				70	0.010	0.5
total	1.91		0.00069			4 t
			0.438385 ac.			

LOT 13-62		Left Side Yard	2 Story			
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n
plane 1	0.04	21%	84.0	10	0.200	0.5
plane 2	0.15	79%	84.0	30	0.010	0.5
channel				50	0.010	0.5
total	0.19		0.00007			4 t
			0.043609 ac.			

Junction 13 with Front Roof

LOT 13-63		Front Roof	2 Story			
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n
plane 1	0.09	100%	99.0	11	0.300	0.1
plane 2		0%				
channel				50	0.005	0.012
total	0.09		0.00003			0.3
			0.020657 ac.			C

LOT 13-64		Front Yard	2 Story			
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n
plane 1	0.11	28%	84.0	15	0.050	0.5
plane 2	0.28	72%	84.0	30	0.010	0.5
channel				80	0.010	0.5
total	0.39		0.00014			4 t
			0.089513 ac.			

LOT 13-65		Street	2 Story			
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n
plane 1	0.11	100%	99.0	66	0.082	0.1
plane 2		0%				
channel				70	0.080	0.05
total	0.11		0.00004			4 t
			0.025247 ac.			

Junction 14 with lot 14

LOT 14-66		Right Side Yard	2 Story			
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope	n
plane 1	0.06	60%	84.0	15	0.500	0.5
plane 2	0.04	40%	84.0	10	0.200	0.5
channel				40	0.01	0.5
total	0.10		0.00004			4 t
			0.022952 ac.			

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Junction 15 with Front Roof.

LOT 14-67 Front Roof 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.09	100%	99.0	11 0.300	0.1			
plane 2		0%						
channel				26 0.005	0.012			C
total	0.09		0.00003					
			0.020657 ac.					

LOT 14-68 Right Side Yard 2 Story

	0.08 A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	
plane 1	0.07	58%	84.0	15 0.500	0.5			
plane 2	0.05	42%	84.0	10 0.230	0.5			
channel				45 ,01	0.5			4 t
total	0.12		0.00004					
			0.027543 ac.					

LOT 14-69 Street 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.02	100%	99.0	66 0.082	0.1			
plane 2		0%						
channel				10 0.080	0.05			4 t
total	0.02		0.00001					
			0.00459 ac.					

LOT 14-70 Drive 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.06	67%	99.0	30 0.082	0.1			
plane 2	0.03	33%	99.0					
channel				20 0.080	0.012	0.3		C
total	0.09		0.00003					
			0.020657 ac.					

Junction 16 with front yard

LOT 14-71 Rear Roof 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.14	100%	99.0	26 0.300	0.1			
plane 2		0%						
channel				52 0.005	0.012			C
total	0.14		0.00005					
			0.032133 ac.					

LOT 14-72 Rear Yard 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.06	7%	84.0	10 0.210	0.5			
plane 2	0.81	93%	84.0	57 0.010	0.5			
channel				70 0.010	0.5			4 t
total	0.87		0.00031					
			0.199683 ac.					

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LOT 14-73 Left Side Yard			2 Story			n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.04	29%	84.0	10 0.200	0.5	
plane 2	0.10	71%	84.0	20 0.010	0.5	
channel				50 0.010	0.5	
total	0.14	0.00005				
		0.032133 ac.				4 t

Junction 17 with Front Roof

LOT 14-74 Front Roof			2 Story			n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.09	100%	99.0	11 0.300	0.1	
plane 2		0%				
channel				50 0.005	0.012	
total	0.09	0.00003			0.3	
		0.020657 ac.				C

LOT 14-75 Front Yard			2 Story			n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.11	55%	84.0	15 0.010	0.5	
plane 2	0.09	45%	84.0	30 0.010	0.5	
channel				80 0.010	0.5	
total	0.20	0.00007				
		0.045904 ac.				4 t

LOT 14-76 Street			1 Story			n Bottom Side slope Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	1.07	37%	99.0	97 0.122	0.1	
plane 2	1.82	63%	84.0	57 0.054	0.5	
channel				340 0.050	,012	
total	2.89	0.00104				
		0.663316 ac.				4 t

Junction 18 with street

LOT 4-77 left side yard			1 story			n Bottom H:V Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.60	80%	84.0	12.0 0.060	0.5	
plane 2	0.15	20%	84.0	3.0 0.500	0.5	
channel				125.0 0.010	0.1	
total	0.75	0.00007			0	
		0.043035 ac.				9 t

LOT 4-78 street			1 story			n Bottom H:V Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	
plane 1	0.10	100%	99.0	162.0 0.054	0.082	
plane 2		0%				
channel				10.0 0.050	0.1	
total	0.10	0.00001			0	
		0.005738 ac.				4 t

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LOT 4-79 drive

	A sq. in.	A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.72	63% drive	99.0 60.0 0.050	0.1			
plane 2	0.43	37% street	99.0 162.0 0.054	0.1			
channel			35.0 0.050	0.012	0.3		C
total	1.15	0.00010 0.065987 ac.					

Junction 19 add front yard

LOT 4-80 rear roof 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.21	100%	99.0 16.0 0.300	0.1			
plane 2		0%					
channel			72.0 0.005	0.012	0.3		C
total	0.21	0.00002 0.01205 ac.					

LOT 4-81 rear yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.30	5%	84.0 10.0 0.060	0.5			
plane 2	5.36	95%	84.0 9 60.0 0.010	0.5			
channel			83.0 0.010	0.5	0	10	t
total	5.66	0.00051 0.324772 ac.					

LOT 4-82 right yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.43	100%	84.0 0.090	0.5			
plane 2							
channel			50.0 ,01	0.5	0	6	t
total	0.43	0.00004 0.024674 ac.					

Junction 20 add front roof

LOT 4-83 front roof 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.13	100%	99.0 21.0 0.300	0.1			
plane 2		0%					
channel			51.0 0.005	0.012	0.3		C
total	0.13	0.00001 0.007459 ac.					

LOT 4-84 front yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.90	73%	84.0 17.0 0.030	0.5			
plane 2	0.33	27%	84.0 2 9.0 0.010	0.5			
channel			110.0 0.010	0.5	0	14	t
total	1.23	0.00011 0.070578 ac.					

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LOT 4-85		street	2 story			n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape			
plane 1	0.16	100% 99.0 162.0 0.054	0.1						
plane 2		0%							
channel			15.0 0.050	0.1	0	4	t		
total	0.16	0.00001 0.009181 ac.							

Junction 21 with lot 3

LOT 3-86		left side yard	2 story			n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape			
plane 1	0.05	10% 84.0 3.0 0.500	0.5						
plane 2	0.45	90% 84.0 27.0 0.030	0.5						
channel			45.0 0.010	0.5	0	22	t		
total	0.50	0.00004 0.02869 ac.							

Junction 22 add left garage roof

LOT 3-87		left garage roof	2 story			n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape			
plane 1	0.36	100% 99.0 11.0 0.300	0.1						
plane 2		0%							
channel			21.0 0.005	0.012	0.3				C
total	0.36	0.00003 0.020657 ac.							

LOT 3-88		left side yard	2 story			n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape			
plane 1	0.10	20% 84.0 3.0 0.500	0.5						
plane 2	0.41	80% 84.0 12.0 0.070	0.5						
channel			85.0 0.010	0.5	0	7	t		
total	0.51	0.00005 0.029264 ac.							

LOT 3-89		drive	2 story			n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape			
plane 1	0.34	63% drive 99.0 50.0 0.020	0.1						
plane 2	0.20	37% street 99.0 162.0 0.054	0.1						
channel			16.0 0.050	0.012	0.3				C
total	0.54	0.00005 0.030985 ac.							

Junction 23 add front yard

LOT 3-90		rear roof	2 story			n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape			
plane 1	0.54	100% 99.0 26.0 0.300	0.1						
plane 2		0%							
channel			52.0 0.005	0.012	0.3				C
total	0.54	0.00005							

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0.030985 ac.

LOT 3-91		rear yard		2 story						
	A sq. in.	% A	A sq. mi.	CN _{2,7}	Imp.	Length, Slope	n	Bottom	H:V	Shape
plane 1	1.69	96%		84.0	6	28.0 0.005	0.5			
plane 2	0.07	4%		84.0		10.0 0.062	0.5			
channel						60.0 0.010	0.5	0	16	t
total	1.76		0.00016							
			0.100989 ac.							

LOT 3-92		right side yard		2 story					
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp	Length, Slope	n	Bottom	H:V	Shape
plane 1	0.20	40%		84.0	10.0 0.030	0.5			
plane 2	0.30	60%		84.0	15.0 0.030	0.5			
channel					60.0 0.010	0.5	0	33	t
total	0.50		0.00004						
			0.02869 ac.						

Junction 24 add front roof

LOT 3-93		front roof		2 story						
		A sq. in.	% A sq. mi.	CN _{2,7}	Imp.	Length, Slope	n	Bottom	H:V	Shape
plane 1		0.07	100%		99.0	26.0 0.300		0.1		
plane 2			0%							
channel						26.0 0.005	0.012		0.3	
total		0.07		0.00001						C
				0.004017 ac						

Junction 25

LOT 3-94		front yard		2 story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	H:V	Shape
plane 1	0.49	41%		84.0	3 15.0 0.010	0.5			
plane 2	0.71	59%		84.0	20.0 0.010	0.5			
channel					72.0 0.010	0.5	0	16	t
total	1.20	0.00011							
		0.068856 ac.							

Junction 26 add next Int

LOT 2-96	left side yard		1 story		n	Bottom	H:V	Shape
	% A sq. mi.	CN _{2.7}	Imp	Length, Slope				
plane 1	1.11	37%	84.0	15.0 0.067	0.5			
plane 2	1.87	63%	84.0	32.0 0.500	0.5			
channel				144.0 0.010	0.5	0	8	t
total	2.98	0.00027		0.170993 ac				

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LOT 2-97 drive

	A sq. in.	A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.42	78% drive	99.0 70.0 0.020	0.1			
plane 2	0.12	22% street	99.0 97.0 0.122	0.1			
channel			25.0 0.120	0.012	0.3		
total	0.54	0.00005 0.030985 ac.					C

Junction 27 add front yard

LOT 2-98 LOT 6: rear roof 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.21	100%	99.0 16.0 0.300	0.1			
plane 2		0%					
channel			72.0 0.005	0.012	0.3		
total	0.21	0.00002 0.01205 ac.					C

LOT 2-99 rear yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.32	9%	84.0 10.0 0.062	0.5			
plane 2	3.14	91%	84.0 9 40.0 0.010	0.5			
channel			85.0 0.010	0.5	0		
total	3.46	0.00031 0.198536 ac.				15	t

LOT 2-100 right yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.18	25%	84.0 10.0 0.063	0.5			
plane 2	0.54	75%	84.0 30.0 0.010	0.5			
channel			60.0 0.010	0.5	0		
total	0.72	0.00006 0.041314 ac.				14	t

Junction 28 add front roof

LOT 2-101 front roof 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	-0.13	100%	99.0 21.0 0.300	0.1			
plane 2		0%					
channel			51.0 0.005	0.012	0.3		
total	0.13	0.00001 0.007459 ac.					C

LOT 2-102 front yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	1.00	40%	84.0 40.0 0.030	0.5			
plane 2	1.50	60%	84.0 2 50.0 0.010	0.5			
channel			95.0 0.050	0.5	0		
total	2.50	0.00022 0.143451 ac.				14	t

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LOT 2-103		street	1 story						
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp.	Length, Slope	n	Bottom	H:V	Shape
plane 1	0.58	33%	99.0	97.0	0.122	0.1			
plane 2	1.19	67%	84.0	13.0	0.500	0.5			
channel				90.0	0.120	0.05	0	4	t
total	1.77	0.00016							
		0.101563 ac.							

Junction 29 with lot 1

LOT 1-104		left side yard		2 story					
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp	Length, Slope	n	Bottom	H:V	Shape
plane 1	0.35	73%		84.0	22.0 0.500	0.5			
plane 2	0.13	27%		84.0	8.0 0.065	0.5			
channel					50.0 0.010	0.5	0	7	t
total	0.48	0.00004							
		0.027543 ac.							

Junction 30 add left garage roof

LOT 1-106		left side yard		2 story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp	Length, Slope	n	Bottom	H:V	Shape
plane 1	0.62	76%		84.0	22.0 0.500	0.5			
plane 2	0.20	24%		84.0	8.0 0.090	0.5			
channel					70.0 0.010	0.5	0	5	t
total	0.82	0.00007							
		0.047052 ac.							

LOT 1-107		drive	2 story					H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp	Length,	Slope	n	Bottom	
plane 1	0.25	63% drive	99.0	45.0	0.050		0.1		
plane 2	0.15	38% street	99.0	34.0	0.028		0.1		
channel				20.0	0.020		0.012	0.3	
total	0.40	0.00004							C
		0.022952 ac.							

Junction 31 add front yard

LOT 1-108		rear roof	2 story					
	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.14	100%	99.0	26.0 0.300	0.1			
plane 2		0%						
channel				52.0 0.005	0.012	0.3		C
total	0.14	0.00001						

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0.008033 ac.

LOT 1-109		rear yard		2 story		n	Bottom	H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	1.64	86%	84.0	6	45.0	0.010	0.5		
plane 2	0.26	14%	84.0		10.0	0.062	0.5		
channel					60.0	0.010	0.5	0	t
total	1.90		0.00017					8	
			0.109022 ac.						

LOT 1-110		right sideyard		2 story		n	Bottom	H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.20	40%	84.0		10.0	0.095	0.5		
plane 2	0.30	60%	84.0		25.0	0.010	0.5		
channel					60.0	0.010	0.5	0	t
total	0.50		0.00004					5	
			0.02869 ac.						

Junction 31 add front roof

LOT 1-111		front roof		2 story		n	Bottom	H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.07	100%	99.0		26.0	0.300	0.1		
plane 2		0%							
channel					26.0	0.005	0.012	0.3	C
total	0.07		0.00001						
			0.004017 ac.						

LOT 1-112		front yard		2 story		n	Bottom	H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.42	42%	84.0	3	15.0	0.010	0.5		
plane 2	0.57	58%	84.0		20.0	0.010	0.5		
channel					80.0	0.010	0.5	0	t
total	0.99		0.00009					16	
			0.056806 ac.						

LOT 1-113		street		1 story		n	Bottom	H:V	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	1.69	80% street	99.0		34.0	0.028	0.05		
plane 2	0.42	20% slope	84.0		10.0	0.500	0.5		
channel					110.0	0.020	0.05	0	t
total	2.11		0.00019					4	
			0.121072 ac.						

LOT 15-114		left side yard		1 story		n	Bottom	H:V	Shape
	% A sq. mi.	CN _{2,7}	Imp Length,	Slope					
plane 1	0.32	21%	84.0		8.0	0.067	0.5		
plane 2	1.21	79%	84.0		30.0	0.500	0.5		
channel					101.0	0.010	0.5	0	t
total	1.53		0.00014					8	
			0.087792 ac.						

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LOT 15-115		left side yard		1 story		n	Bottom	H:V	Shape
		% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	1.58	76%	84.0	8.0	0.065	0.5			
plane 2	0.50	24%	84.0	30.0	0.500	0.5			
channel				70.0	0.010	0.5	0	8	t
total	2.08	0.00019							
		0.119351 ac.							

LOT 15-116		along drive		1 story		n	Bottom	H:V	Shape
		% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.56	100%		20.0	0.060	0.5			
plane 2		0%							
channel				105.0	0.080	0.5	0	4	t
total	0.56	0.00005							
		0.032133 ac.							

LOT 15-117		drive		1 story		n	Bottom	H:V	Shape
A sq. in.	A sq. mi.	CN _{2,7}	Imp Length,	Slope					
plane 1	0.42	57% drive	99.0	190.0	0.080	0.1			
plane 2	0.32	43% street	99.0	48.0	0.060	0.1			
channel				50.0	0.057	0.012	0.3		
total	0.74	0.00007							C
		0.042461 ac.							

Junction 33 with front yard

LOT 15-118		street		1 story		n	Bottom	H:V	Shape
A sq. in.	A sq. mi.	CN _{2,7}	Imp Length,	Slope					
plane 1	0.42	43% slope	99.0	30.0	0.080	0.1			
plane 2	0.56	57% street	99.0	60.0	0.060	0.1			
channel				70.0	0.057	0.012	0.3		
total	0.98	0.00009							C
		0.056233 ac.							

LOT 15-119		LOT 6: rear roof		1 story		n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope					
plane 1	0.21	100%	99.0	16.0	0.300	0.1			
plane 2		0%							
channel				72.0	0.010	0.012	0.3		
total	0.21	0.00002							C
		0.01205 ac.							

LOT 15-120		rear yard		1 story		n	Bottom	H:V	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope					
plane 1	0.30	29%	84.0	10.0	0.062	0.5			
plane 2	0.75	71%	84.0	9	25.0	0.010	0.5		
channel					85.0	0.010	0.5	0	t
total	1.05	0.00009						15	
		0.060249 ac.							

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LOT 15-121 right yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.18	10%	84.0	10.0	0.063	0.5	
plane 2	1.68	90%	84.0	48.0	0.010	0.5	
channel				80.0	0.010	0.5	
total	1.86		0.00017			0	14 t
			0.106727 ac.				

Junction 34 add front roof

LOT 15-122 front roof 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.13	100%	99.0	21.0	0.300	0.1	
plane 2		0%					
channel				51.0	0.005	0.012	
total	0.13		0.00001			0.3	C
			0.007459 ac.				

LOT 15-123 front yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.71	34%	84.0	35.0	0.030	0.5	
plane 2	1.35	66%	84.0	2	40.0	0.005	0.5
channel				75.0	0.020	0.5	
total	2.06		0.00018			0	14 t
			0.118203 ac.				

LOT 15-124 front yard along drive 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.60	100%	84.0	15.0	0.500	0.5	
plane 2		0%					
channel				135.0	0.080	0.5	
total	0.60		0.00005			0	14 t
			0.034428 ac.				

LOT 15-125 street 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.88	45% street	99.0	30.0	0.030	0.1	
plane 2	1.08	55% slope	84.0	30.0	0.500	0.5	
channel				110.0	0.023	0.05	
total	1.96		0.00018			0	4 t
			0.112465 ac.				

LOT 15-126 street & por. Lot 11 1 story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	1.02	49% street	99.0	30.0	0.030	0.1	
plane 2	1.08	51% slope	84.0	150.0	0.150	0.5	
channel				128.0	0.023	0.05	
total	2.10		0.00019			0	4 t
			0.120499 ac.				

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LOT 19-127		behind rear bank	2 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope				
plane 1	4.55	100%		84.0	70	0.250	0.5	
plane 2		0%						
channel				228	0.010	0.5		4 t
total	4.55		0.00041					
			0.26108 ac.					

Junction 35 with street

LOT 19-128		street	2 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope				
plane 1	0.70	67% street	99.0	60 0.060	0.5			
plane 2	0.35	33% slope	84.0	10 0.500	0.5			
channel				88 0.057	0.5			4 t
total	1.05		0.00009					
			0.060249 ac.					

Junction 36 with front yard

LOT 19-129		left side yard	2 store		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope				
plane 1	0.90	57%	84.0	15 0.500	0.5			
plane 2	0.69	43%	84.0	10 0.050	0.5			
channel				180 0.010	0.5			10 t
total	1.59		0.00014					
			0.091235 ac.					

Junction 36 with Front Roof

LOT 19-130		Front Roof	2 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope				
plane 1	0.36	100%	99.0	11 0.300	0.1			
plane 2		0%						
channel				26 0.005	0.012			C
total	0.36		0.00003					
			0.020657 ac.					

LOT 19-131		Front Yard	2 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope				
plane 1	0.11	4%	84.0	6 0.070	0.5			
plane 2	2.82	96%	84.0	120 0.010	0.5			
channel				50 0.010	0.5			4 t
total	2.93		0.00026					
			0.168124 ac.					

LOT 19-132 front yard along drive 2 Story

LOT 19-132		front yard along drive	2 Story		n	Bottom	Side slope	Shape
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope				
plane 1	0.18	100%	99.0	5 0.500	0.5			
plane 2		0%						
channel				88 0.092	0.05			4 t
total	0.18		0.00002					
			0.010328 ac.					

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LOT 19-133		Drive	2 Story		n	Bottom	Side slope	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.54	79% drive	99.0	30	0.050	0.1		
plane 2	0.14	21% street	99.0	49	0.049	0.1		
channel				17	0.045	0.012	0.3	C
total	0.68	0.00006 0.039019 ac.						

Junction 37 with right side yard

LOT 19-134		Rear Roof	2 Story		n	Bottom	Side slope	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.14	100%	99.0	26	0.300	0.1		
plane 2		0%						
channel				52	0.005	0.012		C
total	0.14	0.00001 0.008033 ac.						

LOT 19-135		Rear Yard	2 Story		n	Bottom	Side slope	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.24	12%	84.0	10	0.065	0.5		
plane 2	1.70	88%	84.0	52	0.010	0.5		
channel				60	0.010	0.5		7 t
total	1.94	0.00017 0.111318 ac.						

LOT 19-136		Left Side Yard	2 Story		n	Bottom	Side slope	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.04	17%	84.0	10	0.200	0.5		
plane 2	0.20	83%	84.0	12	0.010	0.5		
channel				50	0.010	0.5		3 t
total	0.24	0.00002 0.013771 ac.						

Junction 38 with Front Roof

LOT 19-137		Front Roof	2 Story		n	Bottom	Side slope	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.09	100%	99.0	11	0.300	0.1		
plane 2		0%						
channel				50	0.005	0.012	0.3	C
total	0.09	0.00001 0.005164 ac.						

LOT 19-138		Right Side Yard	2 Story		n	Bottom	Side slope	Shape
A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length,	Slope				
plane 1	0.08	22%	84.0	10	0.200	0.5		
plane 2	0.28	78%	84.0	12	0.010	0.5		
channel				20	0.010	0.5		3 t
total	0.36	0.00003 0.020657 ac.						

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LOT 19-139 Right Side Yard along drive

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.13	100%		84.0	9	0.500	0.5	
plane 2		0%						
channel				52	0.092	0.5		3 t
total	0.13		0.00001					
			0.007459 ac.					

LOT 19-140 Street 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.80	61% street	99.0	49	0.049	0.1		
plane 2	0.52	39% slope	84.0	13	0.500	0.5		
channel				100	0.045	0.05		4 t
total	1.32		0.00012					
			0.075742 ac.					

LOT 19-141 Street 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.04	33% street	99.0	49	0.049	0.1		
plane 2	2.14	67% slope	84.0	40	0.220	0.5		
channel				130	0.045	0.05		4 t
total	3.18		0.00029					
			0.182469 ac.					

Junction 39 with area behind bank

LOT 19-142 behind bank 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	3.32	100% street	84.0	90	0.200	0.1		
plane 2		0% slope						
channel				240	0.010	0.5		4 t
total	3.32		0.00030					
			0.190502 ac.					

LOT 19-143 street Valley Oaks 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.40	15% street	99.0	49	0.049	0.1		
plane 2	2.22	85% slope	84.0	170	0.180	0.5		
channel				50	0.045	0.05		4 t
total	2.62		0.00023					
			0.150336 ac.					

LOT 19-144 street por. Lot 13 & 14 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.94	13% street	99.0	73	0.073	0.1		
plane 2	6.06	87% slope	84.0	190	0.180	0.5		
channel				118	0.070	0.05		4 t
total	7.00		0.00063					
			0.401662 ac.					

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LOT 19-145 intersection with Keystone 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.24	100% street	99.0 73 0.073	0.1			
plane 2		0%					
channel			115 0.070 0.013	2			4 C
total	1.24	0.00011	0.071152 ac.				

LOT 19-146 street & por. Lot 1 2 Story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	1.16	41% street	99.0 73 0.073	0.1			
plane 2	1.67	59% slope	30 0.500	0.5			
channel			145 0.070 0.05				4 t
total	2.83	0.00025	0.162386 ac.				

LOT 18-147 street Valley Oaks to drive 1 Story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	0.52	100% street	99.0 87 0.087	0.1			
plane 2		0%					
channel			65 0.085 0.05				4 t
total	0.52	0.00005	0.029838 ac.				

LOT 18-148 behind bank 1 Story

	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	Side slope	Shape
plane 1	7.46	100%	84.0 120 0.210	0.5			
plane 2		0%					
channel			212 0.090 0.05				4 t
total	7.46	0.00067	0.428057 ac.				

LOT 18-149 left side yard 1 story

	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.34 17%	84.0 5.0 0.140	0.5			
plane 2	1.70 83%	84.0 30.0 0.500	0.5			
channel		170.0 0.010	0.5	0	4	t
total	2.04	0.00018	0.117056 ac.			

DITCH 150 DITCH along drive 1 story

	Length, Slope	n	Bottom	H:V	Shape
channel	120.0 0.090	0.5	0	4	t

LOT 18-151 drive Valley Oaks

	A sq. in.	A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.42	75% drive	99.0 130.0 0.090	0.1			
plane 2	0.14	25% street	99.0 87.0 0.087	0.1			
channel			17.0 0.085 0.013	2			C
total	0.56	0.00005	0.032133 ac.				

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Junction 40 with front yard

LOT 18-152 rear roof 1 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.21	100%	99.0	16.0 0.300	0.1			
plane 2		0%						
channel				72.0 0.005	0.012	0.3		C
total	0.21		0.00002					
			0.01205 ac.					

LOT 18-153 rear yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.30	11%	84.0	10.0 0.062	0.5			
plane 2	2.53	89%	84.0	98.0 0.010	0.5			
channel				85.0 0.010	0.5	0	15	t
total	2.83		0.00025					
			0.162386 ac.					

LOT 18-154 right yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.18	100%	84.0	11.0 0.063	0.5			
plane 2		0%						
channel				50.0 0.010	0.5	0	14	t
total	0.18		0.00002					
			0.010328 ac.					

Junction 41 add front roof

LOT 18-155 front roof 1 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.13	100%	99.0	21.0 0.300	0.1			
plane 2		0%						
channel				51.0 0.005	0.012	0.3		C
total	0.13		0.00001					
			0.007459 ac.					

LOT 18-156 front yard 1 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.29	38%	84.0	17.0 0.030	0.5			
plane 2	0.48	62%	84.0	2 17.0 0.010	0.5			
channel				70.0 0.010	0.5	0	14	t
total	0.77		0.00007					
			0.044183 ac.					

DITCH 157 DITCH front yard along drive 1 story

	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	#####							
plane 2	#####							
channel				120.0 0.090	0.5	0	14	t
total	0.00		0.00000					
			0 ac.					

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LOT 18-158 street Valley Oaks 1 story
 A sq. in. % A sq. mi. CN_{2,7} Imp Length, Slope n Bottom H:V Shape
 plane 1 0.80 100% street 99.0 87.0 0.087 0.1
 plane 2 0%
 channel
 total 0.80 0.00007 100.0 0.085 0.05 0 4 t
 0.045904 ac.

PIPE 18-159	across street	1 story						
A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	H:V	Shape	
plane 1	##### street							
plane 2	##### slope							
channel			35.0	0.010	0.013	2		C
total	0.00	0.00000						
		0 ac.						

Junction 42 with street Valley Oaks

DITCH 160		DITCH	1 story					
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1		##### street						
plane 2		##### slope						
channel				180.0 0.070 0.05			4	t
total	0.00	0.00000		0 ac.				

LOT 18-161 behind bank Reche 1 story

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp.	Length, Slope	n	Bottom	H:V	Shape
plane 1	1.91	100%		84.0	45.0	0.300	0.5		
plane 2		0%							
channel					140.0	0.250	0.5		
total	1.91	0.00017						4	t
		0.109596 ac.							

Juncture 43 with slope

LOT 18-163		street Reche	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7}	Imp.	Length, Slope	n	Bottom	H:V	Shape
plane 1	0.83	63% street	99.0	27.0	0.021	0.1			
plane 2	0.48	37% slope	84.0	15.0	0.500	0.5			
channel				80.0	0.005	0.05			
total	1.31	0.00012						4	t
		0.075168 ac							

LOT 18-164 street Reche 1 story
 A sq. in. % A sq. mi. CN_{2,7} Imp Length, Slope n Bottom H:V Shape

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plane 1	1.38	33% street	99.0	27.0	0.021	0.1		
plane 2	2.75	67% slope	84.0	40.0	0.500	0.5		
channel				172.0	0.005	0.05		
total	4.13		0.00037				4	t
			0.23698 ac.					

LOT 18-165	street Reche	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape	
plane 1	0.50	11% street	99.0	27.0	0.021	0.1		
plane 2	3.98	89% slope	84.0	100.0	0.140	0.5		
channel				63.0	0.005	0.05		
total	4.48		0.00040				4	t
			0.257064 ac.					

LOT 18-166	intersection	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape	
plane 1	1.11	100% street	99.0	27.0	0.021	0.1		
plane 2		0%						
channel				107.0	0.005	0.05		
total	1.11		0.00010				4	t
			0.063692 ac.					

LOT 18-167	street Reche	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape	
plane 1	1.49	71% street	99.0	27.0	0.021	0.1		
plane 2	0.62	29% slope	84.0	10.0	0.020	0.5		
channel				155.0	0.005	0.05		
total	2.11		0.00019				4	t
			0.121072 ac.					

LOT 18-168	other side of Valley Oaks	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape	
plane 1	0.75	100% street	99.0	36.0	0.060	0.1		
plane 2		0%						
channel				125.0	0.057	0.05		
total	0.75		0.00007				4	t
			0.043035 ac.					

LOT 18-169	other side of Valley Oaks	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape	
plane 1	2.55	100% street	99.0	30.0	0.025	0.1		
plane 2		0%						
channel				425.0	0.023	0.05		
total	2.55		0.00023				4	t
			0.14632 ac.					

LOT 18-170	other side of Valley Oaks	1 story						
	A sq. in.	% A sq. mi.	CN _{2,7} Imp Length, Slope	n	Bottom	H:V	Shape	
plane 1	1.65	100% street	99.0	44.0	0.047	0.1		
plane 2		0%						
channel				275.0	0.045	0.05		
total	1.65		0.00015				4	t
			0.094677 ac.					

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LOT 18-171 other side of Valley Oaks 1 story

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.99	100% street	99.0	52.0 0.072	0.1			
plane 2		0%						
channel				370.0 ,07	0.05		4	t
total	0.99	0.00009						
		0.056806 ac.						

LOT 18-172 other side of Valley Oaks 1 story

	A sq. in.	% A sq. mi.	CN _{2.7}	Imp Length, Slope	n	Bottom	H:V	Shape
plane 1	0.79	100% street	99.0	52.0 0.087	0.1			
plane 2		0%						
channel				165.0 0.085	0.05		4	t
total	0.79	0.00007						
		0.04533 ac.						

Chapter 10 - East Canyon- HEC-RAS Results

Lateral Structure Output

File Type Options Help

River: EAST CANYON Profile: Max WS Lat Struct

Reach ALL RS: 14.5 Plan: Plan 01

Plan: Plan 01 EAST CANYON ALL RS: 14.5 Lat Struct Profile: Max WS

E.G. US. (ft)	546.12	Weir Sta US (ft)	20.00
W.S. US. (ft)	545.91	Weir Sta DS (ft)	70.00
E.G. DS (ft)	546.11	Min El Weir Flow (ft)	543.00
W.S. DS (ft)	546.09	Wr Top Wdth (ft)	49.49
Q US (cfs)	459.00	Weir Max Depth (ft)	3.08
Q Leaving Total (cfs)	252.89	Weir Avg Depth (ft)	1.77
Q DS (cfs)	206.11	Weir Flow Area (sq ft)	87.73
Perc Q Leaving	55.10	Weir Coef	2.000
Q Weir (cfs)	252.89	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
Q Breach (cfs)		Gate Area (sq ft)	
Breach Avg Velocity (ft/s)		Gate Submerg	
Breach Flow Area (sq ft)		Gate Invert (ft)	
		Gate Weir Coef	

Culvert Output

File Type Options Help

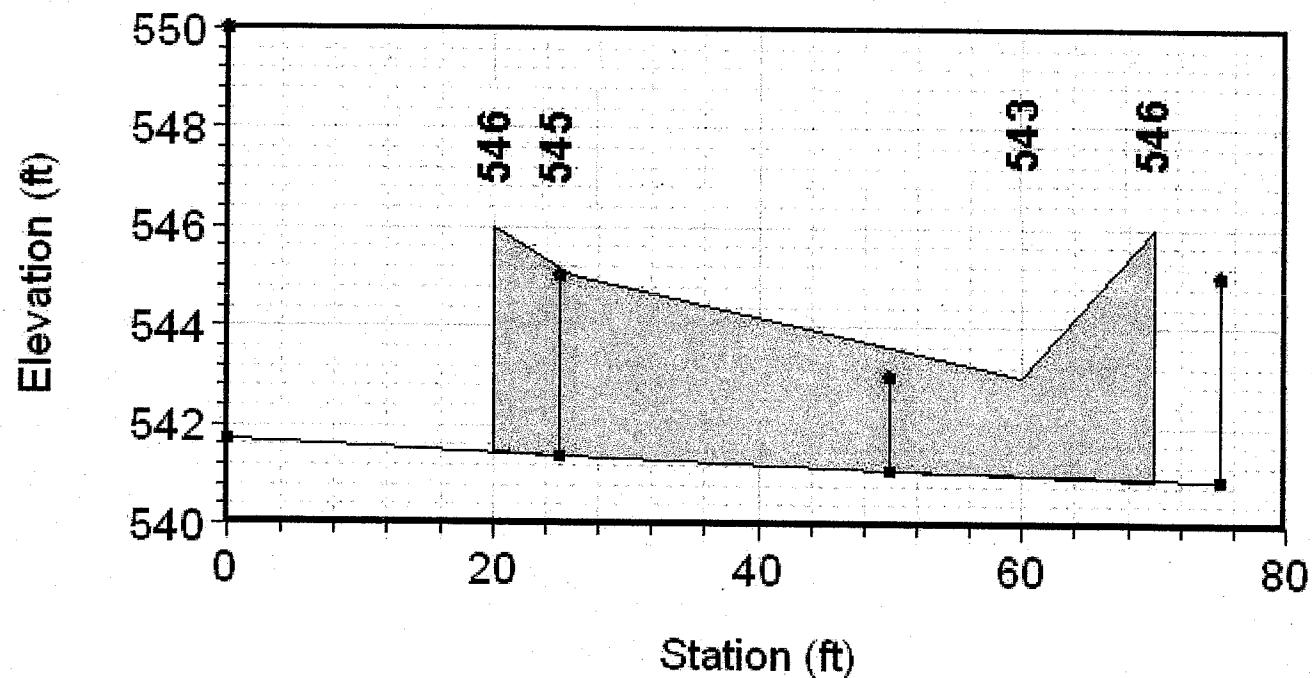
River: EAST CANYON Profile: Max WS Culv Group: Culvert #1

Reach: ALL RS: 9 Plan: Plan 01

Plan: Plan 01 / EAST CANYON / ALL / RS: 9 / Culv Group: Culvert #1 / Profile: Max WS

Q Culv Group (cfs)	123.83	Culv Full Len (ft)	70.00
# Barrels	1	Culv Vel US (ft/s)	9.99
Q Barrel (cfs)	123.83	Culv Vel DS (ft/s)	7.79
E.G. US (ft)	546.10	Culv Inv El Up (ft)	540.50
W.S. US (ft)	545.93	Culv Inv El Dn (ft)	529.00
E.G. DS (ft)	541.70	Culv Friction Ls (ft)	2.84
W.S. DS (ft)	541.55	Culv Exit Loss (ft)	0.78
Delta EG (ft)	4.39	Culv Entr Loss (ft)	0.77
Delta WS (ft)	4.38	Q Weir (cfs) ROAD	OVERFLOW 82.28
E.G. IC (ft)	545.99	Weir Sta Lft (ft)	92.07
E.G. DC (ft)	546.10	Weir Sta Rgt (ft)	147.00
Culvert Control	Inlet	Weir Submerg	0.00
Culv WS Inlet (ft)	543.79	Weir Max Depth (ft)	1.26
Culv WS Outlet (ft)	533.50	Weir Avg Depth (ft)	0.90
Culv Nml Depth (ft)	1.86	Weir Flow Area (sq ft)	31.85
Culv Cut Depth (ft)	3.28	Min El/Weir Flow (ft)	545.01

SIDE WIER, LOOKING WEST



Plan: Plan 01 EAST CANYON ALL RS: 35 Profile: Max WS

E.G. Elev (ft)	566.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.20	Wt. n-Val.		0.030	
W.S. Elev (ft)	563.62	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	564.41	Flow Area (sq ft)		31.97	
E.G. Slope (ft/ft)	0.125125	Area (sq ft)		31.97	
Q Total (cfs)	459.00	Flow (cfs)		459.00	
Top Width (ft)	42.88	Top Width (ft)		42.88	
Vel Total (ft/s)	14.36	Avg. Vel. (ft/s)		14.36	
Max Chl Dpth (ft)	1.62	Hydr. Depth (ft)		0.75	
Conv. Total (cfs)	1297.6	Conv. (cfs)		1297.6	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		43.10	
Min Ch El (ft)	562.00	Shear (lb/sq ft)		5.79	
Alpha	1.00	Stream Power (lb/ft s)		83.19	
Frctn Loss (ft)	2.16	Cum Volume (acre-ft)		1.10	
C & E Loss (ft)		Cum SA (acres)		0.65	

Plan: Plan 01 EAST CANYON ALL RS: 34 Profile: Max WS

E.G. Elev (ft)	562.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.52	Wt. n-Val.		0.030	
W.S. Elev (ft)	561.29	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	561.76	Flow Area (sq ft)		46.50	
E.G. Slope (ft/ft)	0.063446	Area (sq ft)		46.50	
Q Total (cfs)	459.41	Flow (cfs)		459.41	
Top Width (ft)	65.87	Top Width (ft)		65.87	
Vel Total (ft/s)	9.88	Avg. Vel. (ft/s)		9.88	
Max Chl Dpth (ft)	1.29	Hydr. Depth (ft)		0.71	
Conv. Total (cfs)	1823.9	Conv. (cfs)		1823.9	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		65.97	
Min Ch El (ft)	560.00	Shear (lb/sq ft)		2.79	
Alpha	1.00	Stream Power (lb/ft s)		27.58	
Frctn Loss (ft)	1.83	Cum Volume (acre-ft)		1.07	
C & E Loss (ft)		Cum SA (acres)		0.62	

Plan: Plan 01 EAST CANYON ALL RS: 33 Profile: Max WS

E.G. Elev (ft)	563.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.96	Wt. n-Val.		0.030	
W.S. Elev (ft)	559.44	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	560.59	Flow Area (sq ft)		28.77	
E.G. Slope (ft/ft)	0.085741	Area (sq ft)		28.77	
Q Total (cfs)	459.22	Flow (cfs)		459.22	
Top Width (ft)	24.52	Top Width (ft)		24.52	
Vel Total (ft/s)	15.96	Avg. Vel. (ft/s)		15.96	
Max Chl Dpth (ft)	1.94	Hydr. Depth (ft)		1.17	
Conv. Total (cfs)	1568.3	Conv. (cfs)		1568.3	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		24.91	
Min Ch El (ft)	557.50	Shear (lb/sq ft)		6.18	
Alpha	1.00	Stream Power (lb/ft s)		98.67	
Frctn Loss (ft)	1.09	Cum Volume (acre-ft)		1.05	
C & E Loss (ft)		Cum SA (acres)		0.60	

Plan: Plan 01 EAST CANYON ALL RS: 32 Profile: Max WS					
E.G. Elev (ft)	559.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.16	Wt. n-Val.		0.030	
W.S. Elev (ft)	558.05	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	558.38	Flow Area (sq ft)		52.98	
E.G. Slope (ft/ft)	0.026332	Area (sq ft)		52.98	
Q Total (cfs)	458.58	Flow (cfs)		458.58	
Top Width (ft)	46.67	Top Width (ft)		46.67	
Vel Total (ft/s)	8.66	Avg. Vel. (ft/s)		8.66	
Max Chl Dpth (ft)	2.05	Hydr. Depth (ft)		1.14	
Conv. Total (cfs)	2826.0	Conv. (cfs)		2826.0	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		47.41	
Min Ch El (ft)	556.00	Shear (lb/sq ft)		1.84	
Alpha	1.00	Stream Power (lb/ft s)		15.90	
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)		1.03	
C & E Loss (ft)		Cum SA (acres)		0.58	

Plan: Plan 01 EAST CANYON ALL RS: 31 Profile: Max WS

E.G. Elev (ft)	558.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.00	Wt. n-Val.		0.030	
W.S. Elev (ft)	557.50	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	557.72	Flow Area (sq ft)		56.98	
E.G. Slope (ft/ft)	0.018466	Area (sq ft)		56.98	
Q Total (cfs)	457.21	Flow (cfs)		457.21	
Top Width (ft)	43.45	Top Width (ft)		43.45	
Vel Total (ft/s)	8.02	Avg. Vel. (ft/s)		8.02	
Max Chl Dpth (ft)	2.20	Hydr. Depth (ft)		1.31	
Conv. Total (cfs)	3364.5	Conv. (cfs)		3364.5	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		43.78	
Min Ch El (ft)	555.30	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)		12.04	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		1.00	
C & E Loss (ft)		Cum SA (acres)		0.55	

Plan: Plan 01 EAST CANYON ALL RS: 30 Profile: Max WS

E.G. Elev (ft)	558.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.05	Wt. n-Val.		0.030	
W.S. Elev (ft)	557.06	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	557.25	Flow Area (sq ft)		55.49	
E.G. Slope (ft/ft)	0.016205	Area (sq ft)		55.49	
Q Total (cfs)	457.04	Flow (cfs)		457.04	
Top Width (ft)	36.75	Top Width (ft)		36.75	
Vel Total (ft/s)	8.24	Avg. Vel. (ft/s)		8.24	
Max Chl Dpth (ft)	2.66	Hydr. Depth (ft)		1.51	
Conv. Total (cfs)	3590.4	Conv. (cfs)		3590.4	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		37.17	
Min Ch El (ft)	554.40	Shear (lb/sq ft)		1.51	
Alpha	1.00	Stream Power (lb/ft s)		12.44	
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)		0.97	
C & E Loss (ft)		Cum SA (acres)		0.53	

Plan: Plan 01 EAST CANYON ALL RS: 29 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	558.03	Element			
Vel Head (ft)	1.48	Wt. n-Val.		0.030	
W.S. Elev (ft)	556.55	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	556.96	Flow Area (sq ft)		46.83	
E.G. Slope (ft/ft)	0.024551	Area (sq ft)		46.83	
Q Total (cfs)	457.34	Flow (cfs)		457.34	
Top Width (ft)	32.38	Top Width (ft)		32.38	
Vel Total (ft/s)	9.77	Avg. Vel. (ft/s)		9.77	
Max Chl Dpth (ft)	3.15	Hydr. Depth (ft)		1.45	
Conv. Total (cfs)	2918.8	Conv. (cfs)		2918.8	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		33.17	
Min Ch El (ft)	553.40	Shear (lb/sq ft)		2.16	
Alpha	1.00	Stream Power (lb/ft s)		21.13	
Frctn Loss (ft)	0.81	Cum Volume (acre-ft)		0.94	
C & E Loss (ft)		Cum SA (acres)		0.51	

Plan: Plan 01 EAST CANYON ALL RS: 28 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	558.38	Element			
Vel Head (ft)	2.70	Wt. n-Val.		0.030	
W.S. Elev (ft)	555.68	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	556.54	Flow Area (sq ft)		34.75	
E.G. Slope (ft/ft)	0.044396	Area (sq ft)		34.75	
Q Total (cfs)	457.87	Flow (cfs)		457.87	
Top Width (ft)	23.12	Top Width (ft)		23.12	
Vel Total (ft/s)	13.18	Avg. Vel. (ft/s)		13.18	
Max Chl Dpth (ft)	3.48	Hydr. Depth (ft)		1.50	
Conv. Total (cfs)	2173.0	Conv. (cfs)		2173.0	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		24.49	
Min Ch El (ft)	552.20	Shear (lb/sq ft)		3.93	
Alpha	1.00	Stream Power (lb/ft s)		51.81	
Frctn Loss (ft)	1.65	Cum Volume (acre-ft)		0.91	
C & E Loss (ft)		Cum SA (acres)		0.49	

Plan: Plan 01 EAST CANYON ALL RS: 27 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	560.42	Element			
Vel Head (ft)	6.64	Wt. n-Val.		0.030	
W.S. Elev (ft)	553.78	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	555.38	Flow Area (sq ft)		22.18	
E.G. Slope (ft/ft)	0.107620	Area (sq ft)		22.18	
Q Total (cfs)	458.57	Flow (cfs)		458.57	
Top Width (ft)	14.11	Top Width (ft)		14.11	
Vel Total (ft/s)	20.68	Avg. Vel. (ft/s)		20.68	
Max Chl Dpth (ft)	2.98	Hydr. Depth (ft)		1.57	
Conv. Total (cfs)	1397.9	Conv. (cfs)		1397.9	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		15.45	
Min Ch El (ft)	550.80	Shear (lb/sq ft)		9.65	
Alpha	1.00	Stream Power (lb/ft s)		199.44	
Frctn Loss (ft)	1.48	Cum Volume (acre-ft)		0.90	
C & E Loss (ft)		Cum SA (acres)		0.48	

Plan: Plan 01 EAST CANYON ALL RS: 26 Profile: Max WS			Left OB	Channel	Right OB
E.G. Elev (ft)	554.96	Element			
Vel Head (ft)	2.99	Wt. n-Val.		0.030	
W.S. Elev (ft)	551.96	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	552.93	Flow Area (sq ft)		33.06	
E.G. Slope (ft/ft)	0.037214	Area (sq ft)		33.06	
Q Total (cfs)	459.02	Flow (cfs)		459.02	
Top Width (ft)	17.36	Top Width (ft)		17.36	
Vel Total (ft/s)	13.89	Avg. Vel. (ft/s)		13.89	
Max Chl Dpth (ft)	3.26	Hydr. Depth (ft)		1.90	
Conv. Total (cfs)	2379.5	Conv. (cfs)		2379.5	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		18.87	
Min Ch El (ft)	548.70	Shear (lb/sq ft)		4.07	
Alpha	1.00	Stream Power (lb/ft s)		56.52	
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)		0.88	
C & E Loss (ft)		Cum SA (acres)		0.47	

Plan: Plan 01 EAST CANYON ALL RS: 25 Profile: Max WS			Left OB	Channel	Right OB
E.G. Elev (ft)	553.28	Element			
Vel Head (ft)	2.16	Wt. n-Val.		0.030	
W.S. Elev (ft)	551.13	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	551.79	Flow Area (sq ft)		38.94	
E.G. Slope (ft/ft)	0.030218	Area (sq ft)		38.94	
Q Total (cfs)	459.02	Flow (cfs)		459.02	
Top Width (ft)	23.40	Top Width (ft)		23.40	
Vel Total (ft/s)	11.79	Avg. Vel. (ft/s)		11.79	
Max Chl Dpth (ft)	3.03	Hydr. Depth (ft)		1.66	
Conv. Total (cfs)	2640.6	Conv. (cfs)		2640.6	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		24.31	
Min Ch El (ft)	548.10	Shear (lb/sq ft)		3.02	
Alpha	1.00	Stream Power (lb/ft s)		35.62	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		0.86	
C & E Loss (ft)		Cum SA (acres)		0.46	

Plan: Plan 01 EAST CANYON ALL RS: 24 Profile: Max WS			Left OB	Channel	Right OB
E.G. Elev (ft)	551.52	Element			
Vel Head (ft)	0.91	Wt. n-Val.		0.030	
W.S. Elev (ft)	550.61	Reach Len. (ft)	0.00	26.00	0.00
Crit W.S. (ft)	550.59	Flow Area (sq ft)		59.87	
E.G. Slope (ft/ft)	0.011154	Area (sq ft)		59.87	
Q Total (cfs)	459.00	Flow (cfs)		459.00	
Top Width (ft)	32.54	Top Width (ft)		32.54	
Vel Total (ft/s)	7.67	Avg. Vel. (ft/s)		7.67	
Max Chl Dpth (ft)	2.81	Hydr. Depth (ft)		1.84	
Conv. Total (cfs)	4346.2	Conv. (cfs)		4346.2	
Length Wtd. (ft)	26.00	Wetted Per. (ft)		33.75	
Min Ch El (ft)	547.80	Shear (lb/sq ft)		1.24	
Alpha	1.00	Stream Power (lb/ft s)		9.47	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		0.83	
C & E Loss (ft)		Cum SA (acres)		0.44	

Plan: Plan 01 EAST CANYON ALL RS: 23 Profile: Max WS					
E.G. Elev (ft)	551.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.75	Wt. n-Val.		0.030	
W.S. Elev (ft)	550.14	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	550.66	Flow Area (sq ft)		43.24	
E.G. Slope (ft/ft)	0.025556	Area (sq ft)		43.24	
Q Total (cfs)	458.99	Flow (cfs)		458.99	
Top Width (ft)	26.88	Top Width (ft)		26.88	
Vel Total (ft/s)	10.61	Avg. Vel. (ft/s)		10.61	
Max Chl Dpth (ft)	2.94	Hydr. Depth (ft)		1.61	
Conv. Total (cfs)	2871.1	Conv. (cfs)		2871.1	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		27.86	
Min Ch El (ft)	547.20	Shear (lb/sq ft)		2.48	
Alpha	1.00	Stream Power (lb/ft s)		26.28	
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)		0.80	
C & E Loss (ft)		Cum SA (acres)		0.43	

Plan: Plan 01 EAST CANYON ALL RS: 22 Profile: Max WS					
E.G. Elev (ft)	552.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.66	Wt. n-Val.		0.030	
W.S. Elev (ft)	549.35	Reach Len. (ft)	0.00	26.00	0.00
Crit W.S. (ft)	550.21	Flow Area (sq ft)		35.07	
E.G. Slope (ft/ft)	0.038251	Area (sq ft)		35.07	
Q Total (cfs)	458.98	Flow (cfs)		458.98	
Top Width (ft)	21.32	Top Width (ft)		21.32	
Vel Total (ft/s)	13.09	Avg. Vel. (ft/s)		13.09	
Max Chl Dpth (ft)	2.75	Hydr. Depth (ft)		1.64	
Conv. Total (cfs)	2346.8	Conv. (cfs)		2346.8	
Length Wtd. (ft)	26.00	Wetted Per. (ft)		22.33	
Min Ch El (ft)	546.60	Shear (lb/sq ft)		3.75	
Alpha	1.00	Stream Power (lb/ft s)		49.08	
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)		0.78	
C & E Loss (ft)		Cum SA (acres)		0.41	

Plan: Plan 01 EAST CANYON ALL RS: 21 Profile: Max WS					
E.G. Elev (ft)	552.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.62	Wt. n-Val.		0.030	
W.S. Elev (ft)	547.80	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	549.06	Flow Area (sq ft)		26.62	
E.G. Slope (ft/ft)	0.082672	Area (sq ft)		26.62	
Q Total (cfs)	459.00	Flow (cfs)		459.00	
Top Width (ft)	19.03	Top Width (ft)		19.03	
Vel Total (ft/s)	17.25	Avg. Vel. (ft/s)		17.25	
Max Chl Dpth (ft)	2.80	Hydr. Depth (ft)		1.40	
Conv. Total (cfs)	1596.4	Conv. (cfs)		1596.4	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		19.97	
Min Ch El (ft)	545.00	Shear (lb/sq ft)		6.88	
Alpha	1.00	Stream Power (lb/ft s)		118.60	
Frctn Loss (ft)	0.91	Cum Volume (acre-ft)		0.76	
C & E Loss (ft)		Cum SA (acres)		0.40	

Plan: Plan 01 EAST CANYON ALL RS: 20 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	548.05	Element			
Vel Head (ft)	1.52	Wt. n-Val.		0.030	
W.S. Elev (ft)	546.52	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	546.93	Flow Area (sq ft)		46.38	
E.G. Slope (ft/ft)	0.020437	Area (sq ft)		46.38	
Q Total (cfs)	459.00	Flow (cfs)		459.00	
Top Width (ft)	27.28	Top Width (ft)		27.28	
Vel Total (ft/s)	9.90	Avg. Vel. (ft/s)		9.90	
Max Chl Dpth (ft)	2.72	Hydr. Depth (ft)		1.70	
Conv. Total (cfs)	3210.8	Conv. (cfs)		3210.8	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		28.06	
Min Ch El (ft)	543.80	Shear (lb/sq ft)		2.11	
Alpha	1.00	Stream Power (lb/ft s)		20.87	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)		0.74	
C & E Loss (ft)		Cum SA (acres)		0.39	

Plan: Plan 01 EAST CANYON ALL RS: 19 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	546.80	Element			
Vel Head (ft)	0.60	Wt. n-Val.		0.030	
W.S. Elev (ft)	546.20	Reach Len. (ft)	0.00	23.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		73.80	
E.G. Slope (ft/ft)	0.005761	Area (sq ft)		73.80	
Q Total (cfs)	459.00	Flow (cfs)		459.00	
Top Width (ft)	33.48	Top Width (ft)		33.48	
Vel Total (ft/s)	6.22	Avg. Vel. (ft/s)		6.22	
Max Chl Dpth (ft)	3.20	Hydr. Depth (ft)		2.20	
Conv. Total (cfs)	6047.3	Conv. (cfs)		6047.3	
Length Wtd. (ft)	23.00	Wetted Per. (ft)		34.68	
Min Ch El (ft)	543.00	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)		4.76	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		0.70	
C & E Loss (ft)		Cum SA (acres)		0.37	

Plan: Plan 01 EAST CANYON ALL RS: 18 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	546.67	Element			
Vel Head (ft)	0.74	Wt. n-Val.		0.030	
W.S. Elev (ft)	545.93	Reach Len. (ft)	0.00	21.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		66.38	
E.G. Slope (ft/ft)	0.007896	Area (sq ft)		66.38	
Q Total (cfs)	459.00	Flow (cfs)		459.00	
Top Width (ft)	32.69	Top Width (ft)		32.69	
Vel Total (ft/s)	6.91	Avg. Vel. (ft/s)		6.91	
Max Chl Dpth (ft)	3.53	Hydr. Depth (ft)		2.03	
Conv. Total (cfs)	5165.5	Conv. (cfs)		5165.5	
Length Wtd. (ft)	21.00	Wetted Per. (ft)		33.71	
Min Ch El (ft)	542.40	Shear (lb/sq ft)		0.97	
Alpha	1.00	Stream Power (lb/ft s)		6.71	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		0.67	
C & E Loss (ft)		Cum SA (acres)		0.35	

Plan: Plan 01 EAST CANYON ALL RS: 17 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	546.50	Element			
Vel Head (ft)	0.52	Wt. n-Val.		0.030	
W.S. Elev (ft)	545.98	Reach Len. (ft)	0.00	21.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		79.30	
E.G. Slope (ft/ft)	0.004585	Area (sq ft)		79.30	
Q Total (cfs)	459.00	Flow (cfs)		459.00	
Top Width (ft)	33.54	Top Width (ft)		33.54	
Vel Total (ft/s)	5.79	Avg. Vel. (ft/s)		5.79	
Max Chl Dpth (ft)	3.78	Hydr. Depth (ft)		2.36	
Conv. Total (cfs)	6778.6	Conv. (cfs)		6778.6	
Length Wtd. (ft)	21.00	Wetted Per. (ft)		34.97	
Min Ch El (ft)	542.20	Shear (lb/sq ft)		0.65	
Alpha	1.00	Stream Power (lb/ft s)		3.76	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		0.63	
C & E Loss (ft)		Cum SA (acres)		0.34	

Plan: Plan 01 EAST CANYON ALL RS: 16 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	546.40	Element			
Vel Head (ft)	0.56	Wt. n-Val.		0.030	
W.S. Elev (ft)	545.84	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		76.76	
E.G. Slope (ft/ft)	0.005235	Area (sq ft)		76.76	
Q Total (cfs)	459.00	Flow (cfs)		459.00	
Top Width (ft)	34.21	Top Width (ft)		34.21	
Vel Total (ft/s)	5.98	Avg. Vel. (ft/s)		5.98	
Max Chl Dpth (ft)	3.94	Hydr. Depth (ft)		2.24	
Conv. Total (cfs)	6343.6	Conv. (cfs)		6343.6	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		35.62	
Min Ch El (ft)	541.90	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)		4.21	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		0.59	
C & E Loss (ft)		Cum SA (acres)		0.32	

Plan: Plan 01 EAST CANYON ALL RS: 15 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	546.27	Element			
Vel Head (ft)	0.60	Wt. n-Val.		0.030	
W.S. Elev (ft)	545.66	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		73.66	
E.G. Slope (ft/ft)	0.006025	Area (sq ft)		73.66	
Q Total (cfs)	459.00	Flow (cfs)		459.00	
Top Width (ft)	34.51	Top Width (ft)		34.51	
Vel Total (ft/s)	6.23	Avg. Vel. (ft/s)		6.23	
Max Chl Dpth (ft)	3.96	Hydr. Depth (ft)		2.13	
Conv. Total (cfs)	5913.2	Conv. (cfs)		5913.2	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		35.70	
Min Ch El (ft)	541.70	Shear (lb/sq ft)		0.78	
Alpha	1.00	Stream Power (lb/ft s)		4.84	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		0.55	
C & E Loss (ft)		Cum SA (acres)		0.30	

Plan: Plan 01 EAST CANYON ALL RS: 14 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	546.08	Element			
Vel Head (ft)	0.11	Wt. n-Val.		0.030	
W.S. Elev (ft)	545.97	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		173.10	
E.G. Slope (ft/ft)	0.000836	Area (sq ft)		173.10	
Q Total (cfs)	456.41	Flow (cfs)		456.41	
Top Width (ft)	67.66	Top Width (ft)		67.66	
Vel Total (ft/s)	2.64	Avg. Vel. (ft/s)		2.64	
Max Chl Dpth (ft)	4.57	Hydr. Depth (ft)		2.56	
Conv. Total (cfs)	15789.2	Conv. (cfs)		15789.2	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		69.27	
Min Ch El (ft)	541.40	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.34	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)		0.48	
C & E Loss (ft)		Cum SA (acres)		0.27	

Plan: Plan 01 EAST CANYON ALL RS: 13 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	546.10	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
W.S. Elev (ft)	546.06	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		242.72	
E.G. Slope (ft/ft)	0.000179	Area (sq ft)		242.72	
Q Total (cfs)	343.34	Flow (cfs)		343.34	
Top Width (ft)	73.75	Top Width (ft)		73.75	
Vel Total (ft/s)	1.41	Avg. Vel. (ft/s)		1.41	
Max Chl Dpth (ft)	4.96	Hydr. Depth (ft)		3.29	
Conv. Total (cfs)	25634.9	Conv. (cfs)		25634.9	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		77.95	
Min Ch El (ft)	541.10	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		0.36	
C & E Loss (ft)		Cum SA (acres)		0.23	

Plan: Plan 01 EAST CANYON ALL RS: 12 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	546.12	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.030	
W.S. Elev (ft)	546.10	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		179.94	
E.G. Slope (ft/ft)	0.000102	Area (sq ft)		179.94	
Q Total (cfs)	206.11	Flow (cfs)		206.11	
Top Width (ft)	49.57	Top Width (ft)		49.57	
Vel Total (ft/s)	1.15	Avg. Vel. (ft/s)		1.15	
Max Chl Dpth (ft)	5.20	Hydr. Depth (ft)		3.63	
Conv. Total (cfs)	20378.9	Conv. (cfs)		20378.9	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		52.04	
Min Ch El (ft)	540.90	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		0.24	
C & E Loss (ft)		Cum SA (acres)		0.19	

Plan: Plan 01 EAST CANYON ALL RS: 11 Profile: Max WS			Left OB	Channel	Right OB
E.G. Elev (ft)	546.11	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
W.S. Elev (ft)	546.07	Reach Len. (ft)	0.00	30.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		127.36	
E.G. Slope (ft/ft)	0.000275	Area (sq ft)		127.36	
Q Total (cfs)	206.11	Flow (cfs)		206.11	
Top Width (ft)	43.09	Top Width (ft)		43.09	
Vel Total (ft/s)	1.62	Avg. Vel. (ft/s)		1.62	
Max Chl Dpth (ft)	5.37	Hydr. Depth (ft)		2.96	
Conv. Total (cfs)	12429.5	Conv. (cfs)		12429.5	
Length Wtd. (ft)	30.00	Wetted Per. (ft)		46.05	
Min Ch El (ft)	540.70	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		0.15	
C & E Loss (ft)		Cum SA (acres)		0.17	

Plan: Plan 01 EAST CANYON ALL RS: 10 Profile: Max WS			Left OB	Channel	Right OB
E.G. Elev (ft)	546.09	Element			
Vel Head (ft)	0.17	Wt. n-Val.		0.030	
W.S. Elev (ft)	545.93	Reach Len. (ft)	0.00	75.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		62.50	
E.G. Slope (ft/ft)	0.002159	Area (sq ft)		62.50	
Q Total (cfs)	206.11	Flow (cfs)		206.11	
Top Width (ft)	32.45	Top Width (ft)		32.45	
Vel Total (ft/s)	3.30	Avg. Vel. (ft/s)		3.30	
Max Chl Dpth (ft)	5.43	Hydr. Depth (ft)		1.93	
Conv. Total (cfs)	4436.3	Conv. (cfs)		4436.3	
Length Wtd. (ft)	75.00	Wetted Per. (ft)		36.43	
Min Ch El (ft)	540.50	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		0.76	
Frctn Loss (ft)		Cum Volume (acre-ft)		0.09	
C & E Loss (ft)		Cum SA (acres)		0.14	

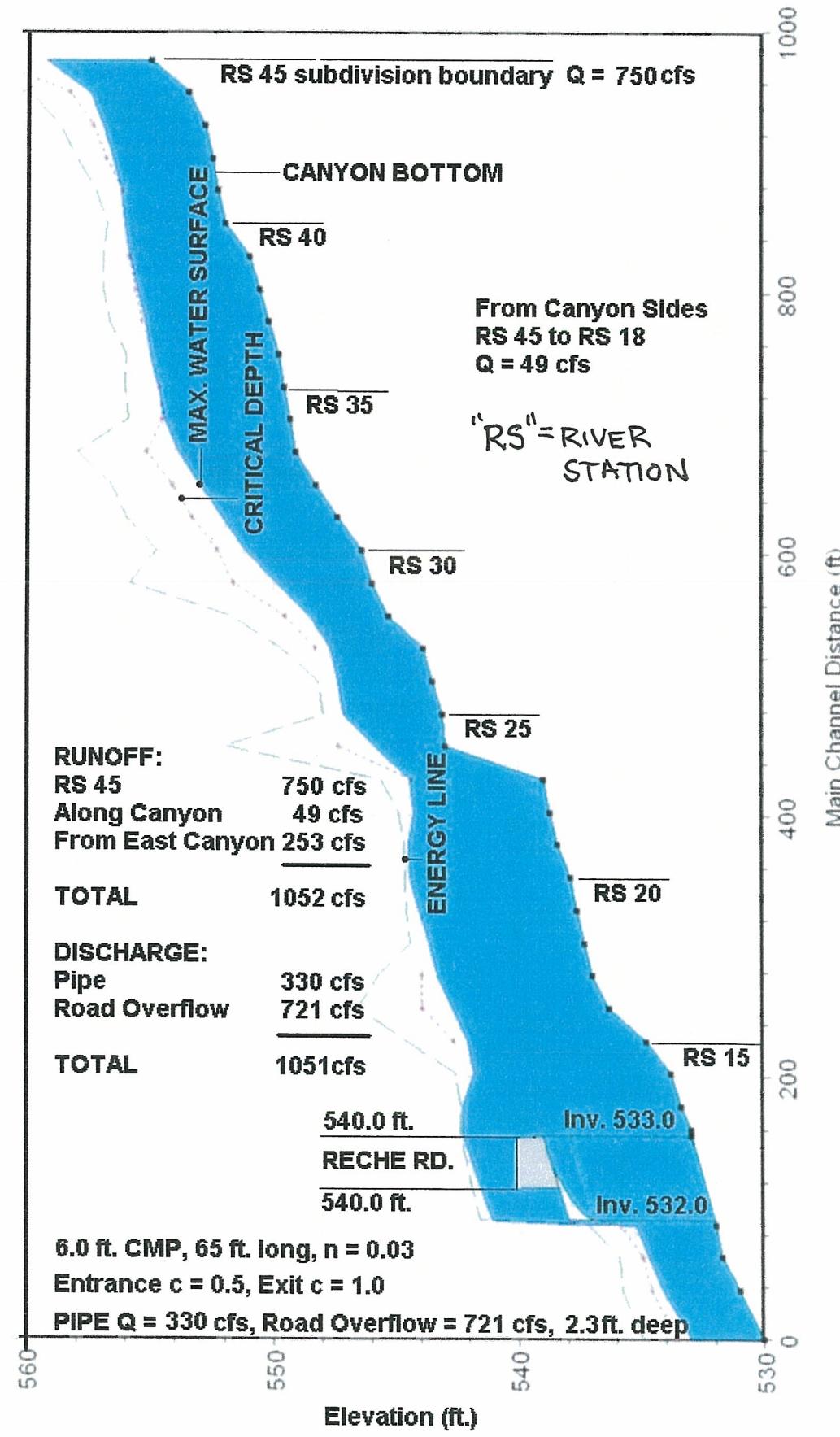
Plan: Plan 01 EAST CANYON ALL RS: 8 Profile: Max WS			Left OB	Channel	Right OB
E.G. Elev (ft)	541.70	Element			
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
W.S. Elev (ft)	541.55	Reach Len. (ft)	0.00	23.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		64.53	
E.G. Slope (ft/ft)	0.005869	Area (sq ft)		64.53	
Q Total (cfs)	206.10	Flow (cfs)		206.10	
Top Width (ft)	83.49	Top Width (ft)		83.49	
Vel Total (ft/s)	3.19	Avg. Vel. (ft/s)		3.19	
Max Chl Dpth (ft)	1.55	Hydr. Depth (ft)		0.77	
Conv. Total (cfs)	2690.4	Conv. (cfs)		2690.4	
Length Wtd. (ft)	23.00	Wetted Per. (ft)		83.58	
Min Ch El (ft)	540.00	Shear (lb/sq ft)		0.28	
Alpha	1.00	Stream Power (lb/ft s)		0.90	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)		0.03	
C & E Loss (ft)		Cum SA (acres)		0.04	

Plan: Plan 01 EAST CANYON ALL RS: 7 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	541.53	Element			
Vel Head (ft)	0.24	Wt. n-Val.			0.030
W.S. Elev (ft)	541.30	Reach Len. (ft)			
Crit W.S. (ft)	541.19	Flow Area (sq ft)			52.70
E.G. Slope (ft/ft)	0.010073	Area (sq ft)			52.70
Q Total (cfs)	206.10	Flow (cfs)			206.10
Top Width (ft)	75.44	Top Width (ft)			75.44
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)			3.91
Max Chl Dpth (ft)	1.40	Hydr. Depth (ft)			0.70
Conv. Total (cfs)	2053.5	Conv. (cfs)			2053.5
Length Wtd. (ft)		Wetted Per. (ft)			75.53
Min Ch El (ft)	539.90	Shear (lb/sq ft)			0.44
Alpha	1.00	Stream Power (lb/ft s)			1.72
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Chapter 11 - West Canyon- HEC-RAS Results

FALLBROOK OAKS, CENTER CANYON AFTER DEVELOPMENT



Culvert Output

File Type Options Help

River: CENTER CANYON Profile: Max WS Culv Group: Culvert #1

Reach ALL RS: 10 Plan: Plan 02

Plan	Plan 02	CENTER CANYON	ALL	RS:	10	Culv Group	Culvert #1	Profile	Max WS
Q Culv Group (cfs)			330.35			Culv Full Len (ft)			65.00
# Barrels				1		Culv Vel US (ft/s)			11.68
Q Barrel (cfs)			330.35			Culv Vel DS (ft/s)			13.25
E.G. US. (ft)			542.27			Culv Inv El Up (ft)			533.00
W.S. US. (ft)			542.17			Culv Inv El Dn (ft)			532.00
E.G. DS (ft)			537.04			Culv Frctn Ls (ft)			1.54
W.S. DS (ft)			535.18			Culv Exit Loss (ft)			2.64
Delta EG (ft)			5.23			Culv Entr Loss (ft)			1.06
Delta W/S (ft)			6.99			Q Weir (cfs)	ROAD OVERFLOW		721.43
E.G. IC (ft)			542.27			Weir Sta Lft (ft)			0.00
E.G. OC (ft)			542.23			Weir Sta Rgt (ft)			82.00
Culvert Control			Inlet			Weir Submerg			0.00
Culv WS Inlet (ft)			539.00			Weir Max Depth (ft)			2.77
Culv WS Outlet (ft)			536.94			Weir Avg Depth (ft)			2.25
Culv Nml Depth (ft)			6.00			Weir Flow Area (sq ft)			184.81
Culv Crt Depth (ft)			4.94			Min El/Weir Flow (ft)			540.01

Plan: Plan 02 CENTER CANYON ALL RS: 45 Profile: Max WS					
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	569.13	Wt. n-Val.		0.030	
Vel Head (ft)	9.95	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	559.17	Flow Area (sq ft)		29.63	
Crit W.S. (ft)	561.57	Area (sq ft)		29.63	
E.G. Slope (ft/ft)	0.119851	Flow (cfs)		750.00	
Q Total (cfs)	750.00	Top Width (ft)		14.19	
Top Width (ft)	14.19	Avg. Vel. (ft/s)		25.31	
Vel Total (ft/s)	25.31	Hydr. Depth (ft)		4.17	
Max Chl Dpth (ft)	4.17	Conv. (cfs)		2166.4	
Conv. Total (cfs)	2166.4	Wetted Per. (ft)		25.00	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		555.00	
Min Ch El (ft)	555.00	Stream Power (lb/ft s)		1.00	
Alpha	1.00	Cum Volume (acre-ft)		1.22	
Frctn Loss (ft)	1.22	Cum SA (acres)			339.75
C & E Loss (ft)					2.34
					1.10

Plan: Plan 02 CENTER CANYON ALL RS: 44 Profile: Max WS					
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	559.84	Wt. n-Val.		0.030	
Vel Head (ft)	2.48	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	557.36	Flow Area (sq ft)		59.41	
Crit W.S. (ft)	558.15	Area (sq ft)		59.41	
E.G. Slope (ft/ft)	0.026264	Flow (cfs)		750.00	
Q Total (cfs)	750.00	Top Width (ft)		29.06	
Top Width (ft)	29.06	Avg. Vel. (ft/s)		12.63	
Vel Total (ft/s)	12.63	Hydr. Depth (ft)		3.86	
Max Chl Dpth (ft)	3.86	Conv. (cfs)		4627.9	
Conv. Total (cfs)	4627.9	Wetted Per. (ft)		25.00	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		553.50	
Min Ch El (ft)	553.50	Stream Power (lb/ft s)		1.00	
Alpha	1.00	Cum Volume (acre-ft)		0.53	
Frctn Loss (ft)	0.53	Cum SA (acres)			40.83
C & E Loss (ft)					2.32
					1.09

Plan: Plan 02 CENTER CANYON ALL RS: 43 Profile: Max WS					
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	558.54	Wt. n-Val.		0.030	
Vel Head (ft)	1.73	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	556.82	Flow Area (sq ft)		71.15	
Crit W.S. (ft)	557.25	Area (sq ft)		71.15	
E.G. Slope (ft/ft)	0.017659	Flow (cfs)		749.98	
Q Total (cfs)	749.98	Top Width (ft)		34.16	
Top Width (ft)	34.16	Avg. Vel. (ft/s)		10.54	
Vel Total (ft/s)	10.54	Hydr. Depth (ft)		4.02	
Max Chl Dpth (ft)	4.02	Conv. (cfs)		5643.7	
Conv. Total (cfs)	5643.7	Wetted Per. (ft)		25.00	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		552.80	
Min Ch El (ft)	552.80	Stream Power (lb/ft s)		1.00	
Alpha	1.00	Cum Volume (acre-ft)		0.41	
Frctn Loss (ft)	0.41	Cum SA (acres)			23.55
C & E Loss (ft)					2.28
					1.07

Plan: Plan 02 CENTER CANYON ALL RS: 42 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	557.87	Element			
Vel Head (ft)	1.46	Wt. n-Val.		0.030	
W.S. Elev (ft)	556.41	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	556.70	Flow Area (sq ft)		77.22	
E.G. Slope (ft/ft)	0.015365	Area (sq ft)		77.22	
Q Total (cfs)	749.95	Flow (cfs)		749.95	
Top Width (ft)	37.74	Top Width (ft)		37.74	
Vel Total (ft/s)	9.71	Avg. Vel. (ft/s)		9.71	
Max Chl Dpth (ft)	3.91	Hydr. Depth (ft)		2.05	
Conv. Total (cfs)	6050.1	Conv. (cfs)		6050.1	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		38.81	
Min Ch El (ft)	552.50	Shear (lb/sq ft)		1.91	
Alpha	1.00	Stream Power (lb/ft s)		18.54	
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)		2.24	
C & E Loss (ft)		Cum SA (acres)		1.05	

Plan: Plan 02 CENTER CANYON ALL RS: 41 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	557.10	Element			
Vel Head (ft)	1.01	Wt. n-Val.		0.030	
W.S. Elev (ft)	556.09	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	556.05	Flow Area (sq ft)		93.08	
E.G. Slope (ft/ft)	0.010084	Area (sq ft)		93.08	
Q Total (cfs)	749.89	Flow (cfs)		749.89	
Top Width (ft)	44.28	Top Width (ft)		44.28	
Vel Total (ft/s)	8.06	Avg. Vel. (ft/s)		8.06	
Max Chl Dpth (ft)	3.79	Hydr. Depth (ft)		2.10	
Conv. Total (cfs)	7467.7	Conv. (cfs)		7467.7	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		45.15	
Min Ch El (ft)	552.30	Shear (lb/sq ft)		1.30	
Alpha	1.00	Stream Power (lb/ft s)		10.46	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		2.19	
C & E Loss (ft)		Cum SA (acres)		1.03	

Plan: Plan 02 CENTER CANYON ALL RS: 40 Profile: Max WS

			Left OB	Channel	Right OB
E.G. Elev (ft)	556.64	Element			
Vel Head (ft)	0.71	Wt. n-Val.		0.030	
W.S. Elev (ft)	555.93	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		110.19	
E.G. Slope (ft/ft)	0.006577	Area (sq ft)		110.19	
Q Total (cfs)	745.07	Flow (cfs)		745.07	
Top Width (ft)	49.74	Top Width (ft)		49.74	
Vel Total (ft/s)	6.76	Avg. Vel. (ft/s)		6.76	
Max Chl Dpth (ft)	3.93	Hydr. Depth (ft)		2.22	
Conv. Total (cfs)	9187.2	Conv. (cfs)		9187.2	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		50.46	
Min Ch El (ft)	552.00	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)		6.06	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		2.13	
C & E Loss (ft)		Cum SA (acres)		1.00	

Plan: Plan 02 CENTER CANYON ALL RS: 39		Profile: Max WS			
E.G. Elev (ft)	556.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.		0.030	
W.S. Elev (ft)	555.69	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	555.78	Flow Area (sq ft)		89.24	
E.G. Slope (ft/ft)	0.012515	Area (sq ft)		89.24	
Q Total (cfs)	749.28	Flow (cfs)		749.28	
Top Width (ft)	46.27	Top Width (ft)		46.27	
Vel Total (ft/s)	8.40	Avg. Vel. (ft/s)		8.40	
Max Chl Dpth (ft)	4.69	Hydr. Depth (ft)		1.93	
Conv. Total (cfs)	6697.6	Conv. (cfs)		6697.6	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		47.85	
Min Ch El (ft)	551.00	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)		12.24	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		2.07	
C & E Loss (ft)		Cum SA (acres)		0.97	

Plan: Plan 02 CENTER CANYON ALL RS: 38		Profile: Max WS			
E.G. Elev (ft)	556.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.		0.030	
W.S. Elev (ft)	555.39	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	555.48	Flow Area (sq ft)		80.89	
E.G. Slope (ft/ft)	0.011625	Area (sq ft)		80.89	
Q Total (cfs)	752.80	Flow (cfs)		752.80	
Top Width (ft)	33.37	Top Width (ft)		33.37	
Vel Total (ft/s)	9.31	Avg. Vel. (ft/s)		9.31	
Max Chl Dpth (ft)	4.79	Hydr. Depth (ft)		2.42	
Conv. Total (cfs)	6982.0	Conv. (cfs)		6982.0	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		35.16	
Min Ch El (ft)	550.60	Shear (lb/sq ft)		1.67	
Alpha	1.00	Stream Power (lb/ft s)		15.54	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)		2.02	
C & E Loss (ft)		Cum SA (acres)		0.95	

Plan: Plan 02 CENTER CANYON ALL RS: 37		Profile: Max WS			
E.G. Elev (ft)	556.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.38	Wt. n-Val.		0.030	
W.S. Elev (ft)	555.11	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	555.21	Flow Area (sq ft)		80.30	
E.G. Slope (ft/ft)	0.011520	Area (sq ft)		80.30	
Q Total (cfs)	756.08	Flow (cfs)		756.08	
Top Width (ft)	32.48	Top Width (ft)		32.48	
Vel Total (ft/s)	9.42	Avg. Vel. (ft/s)		9.42	
Max Chl Dpth (ft)	4.91	Hydr. Depth (ft)		2.47	
Conv. Total (cfs)	7044.3	Conv. (cfs)		7044.3	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		34.07	
Min Ch El (ft)	550.20	Shear (lb/sq ft)		1.70	
Alpha	1.00	Stream Power (lb/ft s)		15.96	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		1.98	
C & E Loss (ft)		Cum SA (acres)		0.93	

Plan: Plan 02 CENTER CANYON ALL RS: 36 Profile: Max WS					
			Left OB	Channel	Right OB
E.G. Elev (ft)	555.80	Element			
Vel Head (ft)	0.91	Wt. n-Val.		0.030	
W.S. Elev (ft)	554.89	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		99.30	
E.G. Slope (ft/ft)	0.006180	Area (sq ft)		99.30	
Q Total (cfs)	760.22	Flow (cfs)		760.22	
Top Width (ft)	34.36	Top Width (ft)		34.36	
Vel Total (ft/s)	7.66	Avg. Vel. (ft/s)		7.66	
Max Chl Dpth (ft)	5.09	Hydr. Depth (ft)		2.89	
Conv. Total (cfs)	9670.0	Conv. (cfs)		9670.0	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		36.02	
Min Ch El (ft)	549.80	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		8.14	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)		1.93	
C & E Loss (ft)		Cum SA (acres)		0.91	

Plan: Plan 02 CENTER CANYON ALL RS: 35 Profile: Max WS					
			Left OB	Channel	Right OB
E.G. Elev (ft)	555.83	Element			
Vel Head (ft)	1.27	Wt. n-Val.		0.030	
W.S. Elev (ft)	554.56	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	554.46	Flow Area (sq ft)		84.74	
E.G. Slope (ft/ft)	0.009224	Area (sq ft)		84.74	
Q Total (cfs)	764.86	Flow (cfs)		764.86	
Top Width (ft)	30.63	Top Width (ft)		30.63	
Vel Total (ft/s)	9.03	Avg. Vel. (ft/s)		9.03	
Max Chl Dpth (ft)	4.96	Hydr. Depth (ft)		2.77	
Conv. Total (cfs)	7963.7	Conv. (cfs)		7963.7	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		32.42	
Min Ch El (ft)	549.60	Shear (lb/sq ft)		1.51	
Alpha	1.00	Stream Power (lb/ft s)		13.58	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)		1.87	
C & E Loss (ft)		Cum SA (acres)		0.89	

Plan: Plan 02 CENTER CANYON ALL RS: 34 Profile: Max WS					
			Left OB	Channel	Right OB
E.G. Elev (ft)	555.68	Element			
Vel Head (ft)	1.37	Wt. n-Val.		0.030	
W.S. Elev (ft)	554.31	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	554.35	Flow Area (sq ft)		81.93	
E.G. Slope (ft/ft)	0.010677	Area (sq ft)		81.93	
Q Total (cfs)	769.75	Flow (cfs)		769.75	
Top Width (ft)	31.02	Top Width (ft)		31.02	
Vel Total (ft/s)	9.40	Avg. Vel. (ft/s)		9.40	
Max Chl Dpth (ft)	5.01	Hydr. Depth (ft)		2.64	
Conv. Total (cfs)	7449.5	Conv. (cfs)		7449.5	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		32.94	
Min Ch El (ft)	549.30	Shear (lb/sq ft)		1.66	
Alpha	1.00	Stream Power (lb/ft s)		15.58	
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)		1.83	
C & E Loss (ft)		Cum SA (acres)		0.87	

Plan: Plan 02 CENTER CANYON		ALL RS: 33	Profile: Max WS			
		Element	Left OB	Channel	Right OB	
E.G. Elev (ft)	557.67	Wt. n-Val.		0.030		
Vel Head (ft)	3.96	Reach Len. (ft)	0.00	25.00	0.00	
W.S. Elev (ft)	553.72	Flow Area (sq ft)		48.43		
Crit W.S. (ft)	555.00	Area (sq ft)		48.43		
E.G. Slope (ft/ft)	0.037276	Flow (cfs)		773.34		
Q Total (cfs)	773.34	Top Width (ft)		19.86		
Top Width (ft)	19.86	Avg. Vel. (ft/s)		15.97		
Vel Total (ft/s)	15.97	Hydr. Depth (ft)		4.62		
Max Chl Dpth (ft)	4.62	Conv. (cfs)		2.44		
Conv. Total (cfs)	4005.5	Wetted Per. (ft)		4005.5		
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		5.02		
Min Ch El (ft)	549.10	Stream Power (lb/ft s)		80.17		
Alpha	1.00	Cum Volume (acre-ft)		1.79		
Frctn Loss (ft)	0.87	Cum SA (acres)		0.86		

Plan: Plan 02 CENTER CANYON		ALL RS: 32	Profile: Max WS			
		Element	Left OB	Channel	Right OB	
E.G. Elev (ft)	556.31	Wt. n-Val.		0.030		
Vel Head (ft)	3.46	Reach Len. (ft)	0.00	25.00	0.00	
W.S. Elev (ft)	552.84	Flow Area (sq ft)		51.87		
Crit W.S. (ft)	553.95	Area (sq ft)		51.87		
E.G. Slope (ft/ft)	0.032448	Flow (cfs)		774.46		
Q Total (cfs)	774.46	Top Width (ft)		22.09		
Top Width (ft)	22.09	Avg. Vel. (ft/s)		14.93		
Vel Total (ft/s)	14.93	Hydr. Depth (ft)		4.54		
Max Chl Dpth (ft)	4.54	Conv. (cfs)		2.35		
Conv. Total (cfs)	4299.3	Wetted Per. (ft)		4299.3		
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		4.39		
Min Ch El (ft)	548.30	Stream Power (lb/ft s)		65.49		
Alpha	1.00	Cum Volume (acre-ft)		1.76		
Frctn Loss (ft)	0.90	Cum SA (acres)		0.85		

Plan: Plan 02 CENTER CANYON		ALL RS: 31	Profile: Max WS			
		Element	Left OB	Channel	Right OB	
E.G. Elev (ft)	555.74	Wt. n-Val.		0.030		
Vel Head (ft)	3.80	Reach Len. (ft)	0.00	25.00	0.00	
W.S. Elev (ft)	551.94	Flow Area (sq ft)		49.52		
Crit W.S. (ft)	553.16	Area (sq ft)		49.52		
E.G. Slope (ft/ft)	0.040317	Flow (cfs)		774.78		
Q Total (cfs)	774.78	Top Width (ft)		22.80		
Top Width (ft)	22.80	Avg. Vel. (ft/s)		15.65		
Vel Total (ft/s)	15.65	Hydr. Depth (ft)		4.54		
Max Chl Dpth (ft)	4.54	Conv. (cfs)		2.17		
Conv. Total (cfs)	3858.6	Wetted Per. (ft)		3858.6		
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		4.97		
Min Ch El (ft)	547.40	Stream Power (lb/ft s)		77.72		
Alpha	1.00	Cum Volume (acre-ft)		1.73		
Frctn Loss (ft)	0.94	Cum SA (acres)		0.84		

Plan: Plan 02 CENTER CANYON ALL RS: 30		Profile: Max WS			
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	554.45	Wt. n-Val.		0.030	
Vel Head (ft)	3.45	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	551.00	Flow Area (sq ft)		51.96	
Crit W.S. (ft)	552.12	Area (sq ft)		51.96	
E.G. Slope (ft/ft)	0.035311	Flow (cfs)		774.94	
Q Total (cfs)	774.94	Top Width (ft)		23.29	
Top Width (ft)	23.29	Avg. Vel. (ft/s)		14.91	
Vel Total (ft/s)	14.91	Hydr. Depth (ft)		2.23	
Max Chl Dpth (ft)	4.60	Conv. (cfs)		4124.0	
Conv. Total (cfs)	4124.0	Wetted Per. (ft)		25.61	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		4.47	
Min Ch El (ft)	546.40	Stream Power (lb/ft s)		66.69	
Alpha	1.00	Cum Volume (acre-ft)		1.70	
Frctn Loss (ft)	1.17	Cum SA (acres)		0.82	

Plan: Plan 02 CENTER CANYON ALL RS: 29		Profile: Max WS			
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	555.48	Wt. n-Val.		0.030	
Vel Head (ft)	5.73	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	549.75	Flow Area (sq ft)		40.37	
Crit W.S. (ft)	551.44	Area (sq ft)		40.37	
E.G. Slope (ft/ft)	0.065601	Flow (cfs)		775.43	
Q Total (cfs)	775.43	Top Width (ft)		19.83	
Top Width (ft)	19.83	Avg. Vel. (ft/s)		19.21	
Vel Total (ft/s)	19.21	Hydr. Depth (ft)		2.04	
Max Chl Dpth (ft)	3.75	Conv. (cfs)		3027.5	
Conv. Total (cfs)	3027.5	Wetted Per. (ft)		21.67	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		7.63	
Min Ch El (ft)	546.00	Stream Power (lb/ft s)		146.56	
Alpha	1.00	Cum Volume (acre-ft)		1.68	
Frctn Loss (ft)	1.35	Cum SA (acres)		0.81	

Plan: Plan 02 CENTER CANYON ALL RS: 28		Profile: Max WS			
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	551.55	Wt. n-Val.		0.030	
Vel Head (ft)	3.16	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	548.39	Flow Area (sq ft)		54.37	
Crit W.S. (ft)	549.38	Area (sq ft)		54.37	
E.G. Slope (ft/ft)	0.045204	Flow (cfs)		775.63	
Q Total (cfs)	775.63	Top Width (ft)		33.87	
Top Width (ft)	33.87	Avg. Vel. (ft/s)		14.27	
Vel Total (ft/s)	14.27	Hydr. Depth (ft)		1.61	
Max Chl Dpth (ft)	3.09	Conv. (cfs)		3648.1	
Conv. Total (cfs)	3648.1	Wetted Per. (ft)		34.48	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		4.45	
Min Ch El (ft)	545.30	Stream Power (lb/ft s)		63.48	
Alpha	1.00	Cum Volume (acre-ft)		1.65	
Frctn Loss (ft)	0.75	Cum SA (acres)		0.79	

Plan: Plan 02 CENTER CANYON		ALL RS: 27	Profile: Max WS		
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	549.49	Wt. n-Val.		0.030	
Vel Head (ft)	1.91	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	547.57	Flow Area (sq ft)		69.76	
Crit W.S. (ft)	548.11	Area (sq ft)		69.76	
E.G. Slope (ft/ft)	0.021125	Flow (cfs)		774.44	
Q Total (cfs)	774.44	Top Width (ft)		35.65	
Top Width (ft)	35.65	Avg. Vel. (ft/s)		11.10	
Vel Total (ft/s)	11.10	Hydr. Depth (ft)		3.67	
Max Chl Dpth (ft)	3.67	Conv. (cfs)		5328.3	
Conv. Total (cfs)	5328.3	Wetted Per. (ft)		25.00	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		543.90	
Min Ch El (ft)	543.90	Stream Power (lb/ft s)		1.00	
Alpha	1.00	Cum Volume (acre-ft)		0.29	
Frctn Loss (ft)	0.29	Cum SA (acres)		0.77	
C & E Loss (ft)	0.77				

Plan: Plan 02 CENTER CANYON		ALL RS: 26	Profile: Max WS		
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	548.01	Wt. n-Val.		0.030	
Vel Head (ft)	0.78	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	547.22	Flow Area (sq ft)		109.12	
Crit W.S. (ft)		Area (sq ft)		109.12	
E.G. Slope (ft/ft)	0.007294	Flow (cfs)		775.59	
Q Total (cfs)	775.59	Top Width (ft)		49.44	
Top Width (ft)	49.44	Avg. Vel. (ft/s)		7.11	
Vel Total (ft/s)	7.11	Hydr. Depth (ft)		3.72	
Max Chl Dpth (ft)	3.72	Conv. (cfs)		9081.3	
Conv. Total (cfs)	9081.3	Wetted Per. (ft)		25.00	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		543.50	
Min Ch El (ft)	543.50	Stream Power (lb/ft s)		1.00	
Alpha	1.00	Cum Volume (acre-ft)		0.17	
Frctn Loss (ft)	0.17	Cum SA (acres)		0.75	
C & E Loss (ft)	0.75				

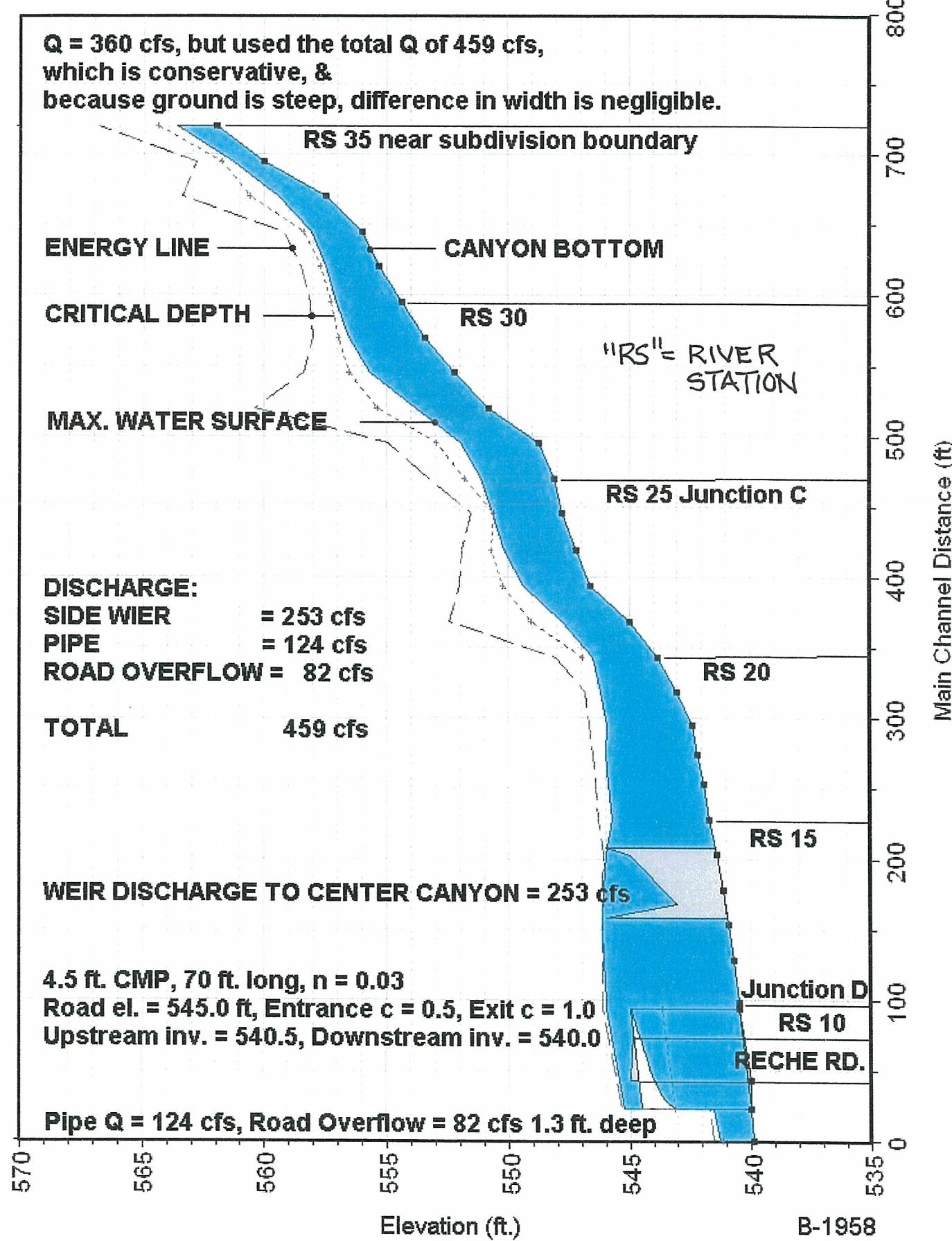
Plan: Plan 02 CENTER CANYON		ALL RS: 25	Profile: Max WS		
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	547.83	Wt. n-Val.		0.030	
Vel Head (ft)	0.75	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	547.09	Flow Area (sq ft)		112.41	
Crit W.S. (ft)		Area (sq ft)		112.41	
E.G. Slope (ft/ft)	0.006070	Flow (cfs)		779.66	
Q Total (cfs)	779.66	Top Width (ft)		45.69	
Top Width (ft)	45.69	Avg. Vel. (ft/s)		6.94	
Vel Total (ft/s)	6.94	Hydr. Depth (ft)		3.99	
Max Chl Dpth (ft)	3.99	Conv. (cfs)		10006.9	
Conv. Total (cfs)	10006.9	Wetted Per. (ft)		25.00	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		543.10	
Min Ch El (ft)	543.10	Stream Power (lb/ft s)		1.00	
Alpha	1.00	Cum Volume (acre-ft)		0.40	
Frctn Loss (ft)	0.40	Cum SA (acres)		0.72	
C & E Loss (ft)	0.72				

Plan: Plan 02 CENTER CANYON ALL RS: 24		Profile: Max WS			
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	551.84	Wt. n-Val.		0.030	
Vel Head (ft)	6.14	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	545.70	Flow Area (sq ft)		39.39	
Crit W.S. (ft)	547.22				
E.G. Slope (ft/ft)	0.106031	Area (sq ft)		39.39	
Q Total (cfs)	783.34	Flow (cfs)		783.34	
Top Width (ft)	27.99	Top Width (ft)		27.99	
Vel Total (ft/s)	19.88	Avg. Vel. (ft/s)		19.88	
Max Chl Dpth (ft)	2.70	Hydr. Depth (ft)		1.41	
Conv. Total (cfs)	2405.7	Conv. (cfs)		2405.7	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		28.78	
Min Ch El (ft)	543.00	Shear (lb/sq ft)		9.06	
Alpha	1.00	Stream Power (lb/ft s)		180.19	
Frctn Loss (ft)	0.60	Cum Volume (acre-ft)		1.45	
C & E Loss (ft)		Cum SA (acres)		0.70	

Plan: Plan 02 CENTER CANYON ALL RS: 23		Profile: Max WS			
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	545.44	Wt. n-Val.		0.030	
Vel Head (ft)	1.18	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	544.26	Flow Area (sq ft)		89.65	
Crit W.S. (ft)	544.23				
E.G. Slope (ft/ft)	0.010254	Area (sq ft)		89.65	
Q Total (cfs)	782.76	Flow (cfs)		782.76	
Top Width (ft)	37.19	Top Width (ft)		37.19	
Vel Total (ft/s)	8.73	Avg. Vel. (ft/s)		8.73	
Max Chl Dpth (ft)	5.26	Hydr. Depth (ft)		2.41	
Conv. Total (cfs)	7730.0	Conv. (cfs)		7730.0	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		39.03	
Min Ch El (ft)	539.00	Shear (lb/sq ft)		1.47	
Alpha	1.00	Stream Power (lb/ft s)		12.84	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		1.42	
C & E Loss (ft)		Cum SA (acres)		0.68	

Plan: Plan 02 CENTER CANYON ALL RS: 22		Profile: Max WS			
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	544.73	Wt. n-Val.		0.030	
Vel Head (ft)	0.62	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	544.11	Flow Area (sq ft)		123.59	
Crit W.S. (ft)					
E.G. Slope (ft/ft)	0.007025	Area (sq ft)		123.59	
Q Total (cfs)	782.13	Flow (cfs)		782.13	
Top Width (ft)	63.23	Top Width (ft)		63.23	
Vel Total (ft/s)	6.33	Avg. Vel. (ft/s)		6.33	
Max Chl Dpth (ft)	5.41	Hydr. Depth (ft)		1.95	
Conv. Total (cfs)	9331.3	Conv. (cfs)		9331.3	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		65.67	
Min Ch El (ft)	538.70	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		5.22	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		1.36	
C & E Loss (ft)		Cum SA (acres)		0.65	

FALLBROOK OAKS, EAST CANYON AFTER DEVELOPMENT



Plan: Plan 02 CENTER CANYON ALL RS: 21		Profile: Max WS	Left OB	Channel	Right OB
E.G. Elev (ft)	544.53	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
W.S. Elev (ft)	544.33	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		217.82	
E.G. Slope (ft/ft)	0.003161	Area (sq ft)		217.82	
Q Total (cfs)	786.69	Flow (cfs)		786.69	
Top Width (ft)	145.37	Top Width (ft)		145.37	
Vel Total (ft/s)	3.61	Avg. Vel. (ft/s)		3.61	
Max Chl Dpth (ft)	5.93	Hydr. Depth (ft)		1.50	
Conv. Total (cfs)	13993.3	Conv. (cfs)		13993.3	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		147.46	
Min Ch El (ft)	538.40	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)		1.05	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		1.26	
C & E Loss (ft)		Cum SA (acres)		0.59	

Plan: Plan 02 CENTER CANYON ALL RS: 20		Profile: Max WS	Left OB	Channel	Right OB
E.G. Elev (ft)	544.46	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
W.S. Elev (ft)	544.26	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		222.11	
E.G. Slope (ft/ft)	0.002212	Area (sq ft)		222.11	
Q Total (cfs)	792.18	Flow (cfs)		792.18	
Top Width (ft)	114.81	Top Width (ft)		114.81	
Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57	
Max Chl Dpth (ft)	6.36	Hydr. Depth (ft)		1.93	
Conv. Total (cfs)	16842.6	Conv. (cfs)		16842.6	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		117.25	
Min Ch El (ft)	537.90	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		0.93	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		1.13	
C & E Loss (ft)		Cum SA (acres)		0.52	

Plan: Plan 02 CENTER CANYON ALL RS: 19		Profile: Max WS	Left OB	Channel	Right OB
E.G. Elev (ft)	544.43	Element			
Vel Head (ft)	0.54	Wt. n-Val.		0.030	
W.S. Elev (ft)	543.89	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		134.73	
E.G. Slope (ft/ft)	0.011001	Area (sq ft)		134.73	
Q Total (cfs)	797.96	Flow (cfs)		797.96	
Top Width (ft)	107.47	Top Width (ft)		107.47	
Vel Total (ft/s)	5.92	Avg. Vel. (ft/s)		5.92	
Max Chl Dpth (ft)	6.29	Hydr. Depth (ft)		1.25	
Conv. Total (cfs)	7607.9	Conv. (cfs)		7607.9	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		110.68	
Min Ch El (ft)	537.60	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)		4.95	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		1.03	
C & E Loss (ft)		Cum SA (acres)		0.46	

Plan: Plan 02 CENTER CANYON ALL RS: 18		Profile: Max WS			
E.G. Elev (ft)	544.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.		0.030	
W.S. Elev (ft)	543.50	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)		Flow Area (sq ft)		114.45	
E.G. Slope (ft/ft)	0.006933	Area (sq ft)		114.45	
Q Total (cfs)	803.42	Flow (cfs)		803.42	
Top Width (ft)	49.64	Top Width (ft)		49.64	
Vel Total (ft/s)	7.02	Avg. Vel. (ft/s)		7.02	
Max Chl Dpth (ft)	6.20	Hydr. Depth (ft)		2.31	
Conv. Total (cfs)	9648.7	Conv. (cfs)		9648.7	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		51.54	
Min Ch El (ft)	537.30	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)		6.75	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)		0.96	
C & E Loss (ft)		Cum SA (acres)		0.41	

Plan: Plan 02 CENTER CANYON ALL RS: 16		Profile: Max WS			
E.G. Elev (ft)	545.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.30	Wt. n-Val.		0.030	
W.S. Elev (ft)	543.20	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	543.79	Flow Area (sq ft)		87.04	
E.G. Slope (ft/ft)	0.017134	Area (sq ft)		87.04	
Q Total (cfs)	1059.56	Flow (cfs)		1059.56	
Top Width (ft)	31.19	Top Width (ft)		31.19	
Vel Total (ft/s)	12.17	Avg. Vel. (ft/s)		12.17	
Max Chl Dpth (ft)	6.20	Hydr. Depth (ft)		2.79	
Conv. Total (cfs)	8094.5	Conv. (cfs)		8094.5	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		33.84	
Min Ch El (ft)	537.00	Shear (lb/sq ft)		2.75	
Alpha	1.00	Stream Power (lb/ft s)		33.50	
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)		0.90	
C & E Loss (ft)		Cum SA (acres)		0.39	

Plan: Plan 02 CENTER CANYON ALL RS: 15		Profile: Max WS			
E.G. Elev (ft)	546.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.69	Wt. n-Val.		0.030	
W.S. Elev (ft)	542.58	Reach Len. (ft)	0.00	25.00	0.00
Crit W.S. (ft)	543.78	Flow Area (sq ft)		68.86	
E.G. Slope (ft/ft)	0.031153	Area (sq ft)		68.86	
Q Total (cfs)	1060.88	Flow (cfs)		1060.88	
Top Width (ft)	25.92	Top Width (ft)		25.92	
Vel Total (ft/s)	15.41	Avg. Vel. (ft/s)		15.41	
Max Chl Dpth (ft)	6.28	Hydr. Depth (ft)		2.66	
Conv. Total (cfs)	6010.6	Conv. (cfs)		6010.6	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		29.43	
Min Ch El (ft)	536.30	Shear (lb/sq ft)		4.55	
Alpha	1.00	Stream Power (lb/ft s)		70.10	
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)		0.86	
C & E Loss (ft)		Cum SA (acres)		0.37	

Plan: Plan 02 CENTER CANYON		ALL RS: 14	Profile: Max WS			
E.G. Elev (ft)	544.30	Element	Left OB	Channel	Right OB	
Vel Head (ft)	2.32	Wt. n-Val.		0.030		
W.S. Elev (ft)	541.99	Reach Len. (ft)	0.00	25.00	0.00	
Crit W.S. (ft)	542.47	Flow Area (sq ft)		86.79		
E.G. Slope (ft/ft)	0.015940	Area (sq ft)		86.79		
Q Total (cfs)	1059.76	Flow (cfs)		1059.76		
Top Width (ft)	27.35	Top Width (ft)		27.35		
Vel Total (ft/s)	12.21	Avg. Vel. (ft/s)		12.21		
Max Chl Dpth (ft)	7.19	Hydr. Depth (ft)		3.17		
Conv. Total (cfs)	8393.9	Conv. (cfs)		8393.9		
Length Wtd. (ft)	25.00	Wetted Per. (ft)		31.81		
Min Ch El (ft)	534.80	Shear (lb/sq ft)		2.72		
Alpha	1.00	Stream Power (lb/ft s)		33.16		
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)		0.81		
C & E Loss (ft)		Cum SA (acres)		0.36		

Plan: Plan 02 CENTER CANYON		ALL RS: 13	Profile: Max WS			
E.G. Elev (ft)	542.45	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.72	Wt. n-Val.		0.030		
W.S. Elev (ft)	541.74	Reach Len. (ft)	0.00	25.00	0.00	
Crit W.S. (ft)		Flow Area (sq ft)		155.57		
E.G. Slope (ft/ft)	0.003919	Area (sq ft)		155.57		
Q Total (cfs)	1057.46	Flow (cfs)		1057.46		
Top Width (ft)	44.96	Top Width (ft)		44.96		
Vel Total (ft/s)	6.80	Avg. Vel. (ft/s)		6.80		
Max Chl Dpth (ft)	7.94	Hydr. Depth (ft)		3.46		
Conv. Total (cfs)	16890.8	Conv. (cfs)		16890.8		
Length Wtd. (ft)	25.00	Wetted Per. (ft)		47.93		
Min Ch El (ft)	533.80	Shear (lb/sq ft)		0.79		
Alpha	1.00	Stream Power (lb/ft s)		5.40		
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		0.74		
C & E Loss (ft)		Cum SA (acres)		0.33		

Plan: Plan 02 CENTER CANYON		ALL RS: 12	Profile: Max WS			
E.G. Elev (ft)	542.26	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.10	Wt. n-Val.		0.030		
W.S. Elev (ft)	542.16	Reach Len. (ft)	0.00	17.00	0.00	
Crit W.S. (ft)		Flow Area (sq ft)		423.89		
E.G. Slope (ft/ft)	0.000314	Area (sq ft)		423.89		
Q Total (cfs)	1054.54	Flow (cfs)		1054.54		
Top Width (ft)	84.67	Top Width (ft)		84.67		
Vel Total (ft/s)	2.49	Avg. Vel. (ft/s)		2.49		
Max Chl Dpth (ft)	8.76	Hydr. Depth (ft)		5.01		
Conv. Total (cfs)	59514.1	Conv. (cfs)		59514.1		
Length Wtd. (ft)	17.00	Wetted Per. (ft)		88.82		
Min Ch El (ft)	533.40	Shear (lb/sq ft)		0.09		
Alpha	1.00	Stream Power (lb/ft s)		0.23		
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		0.57		
C & E Loss (ft)		Cum SA (acres)		0.30		

Plan: Plan 02 CENTER CANYON ALL RS: 11 Profile: Max WS					
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	542.25	Wt. n-Val.		0.030	
Vel Head (ft)	0.07	Reach Len. (ft)	0.00	73.00	0.00
W.S. Elev (ft)	542.17	Flow Area (sq ft)		484.73	
Crit W.S. (ft)		Area (sq ft)		484.73	
E.G. Slope (ft/ft)	0.000196	Flow (cfs)		1051.78	
Q Total (cfs)	1051.78	Top Width (ft)		82.00	
Top Width (ft)	82.00	Avg. Vel. (ft/s)		2.17	
Vel Total (ft/s)	2.17	Hydr. Depth (ft)		5.91	
Max Chl Dpth (ft)	9.17	Conv. (cfs)		75089.7	
Conv. Total (cfs)	75089.7	Wetted Per. (ft)		87.64	
Length Wtd. (ft)	73.00	Shear (lb/sq ft)		0.07	
Min Ch El (ft)	533.00	Stream Power (lb/ft s)		0.15	
Alpha	1.00	Cum Volume (acre-ft)		0.40	
Frctn Loss (ft)		Cum SA (acres)		0.27	
C & E Loss (ft)					

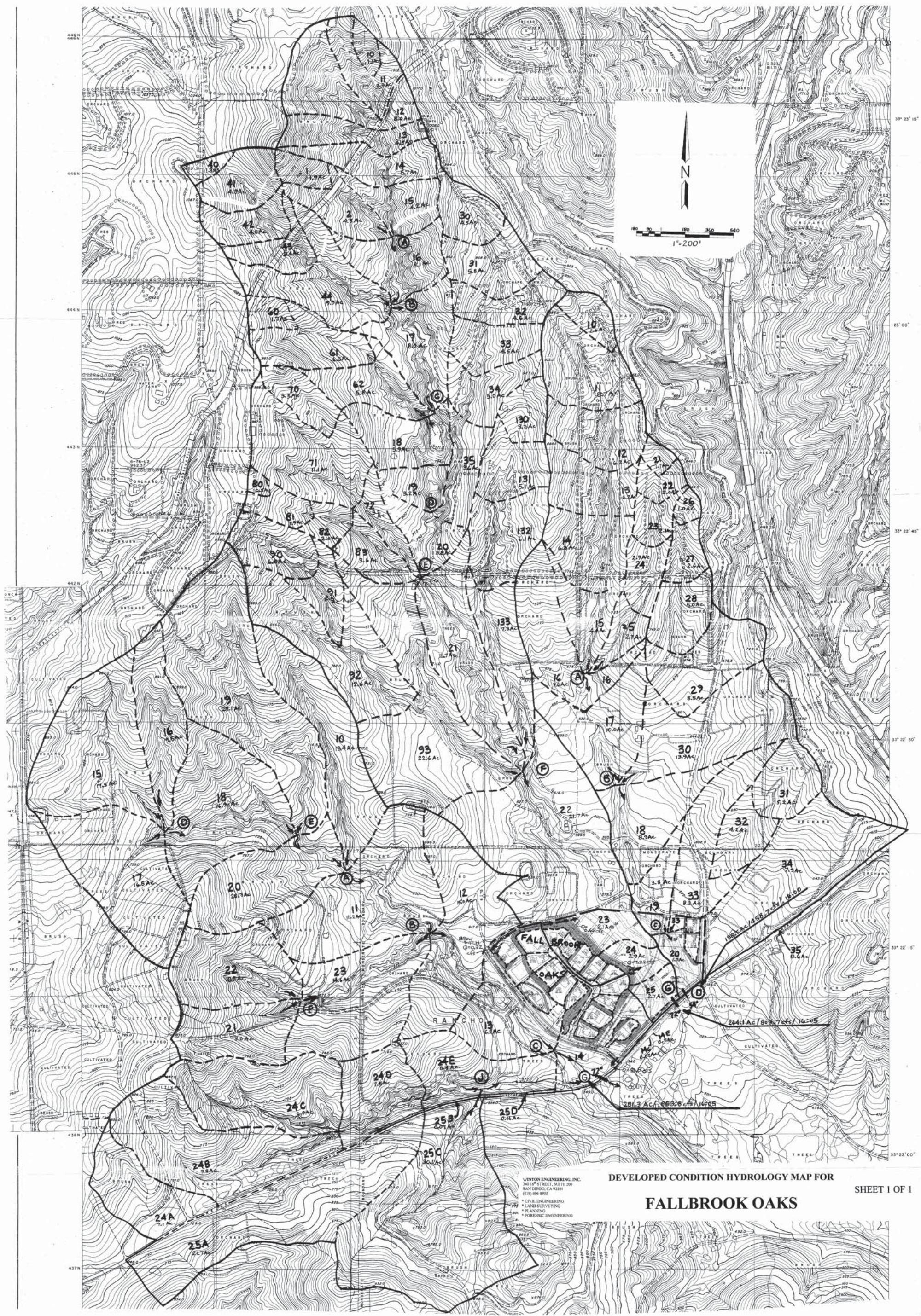
Plan: Plan 02 CENTER CANYON ALL RS: 9 Profile: Max WS					
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	537.04	Wt. n-Val.		0.030	
Vel Head (ft)	1.85	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	535.18	Flow Area (sq ft)		96.31	
Crit W.S. (ft)	535.77	Area (sq ft)		96.31	
E.G. Slope (ft/ft)	0.026355	Flow (cfs)		1051.78	
Q Total (cfs)	1051.78	Top Width (ft)		60.50	
Top Width (ft)	60.50	Avg. Vel. (ft/s)		10.92	
Vel Total (ft/s)	10.92	Hydr. Depth (ft)		1.59	
Max Chl Dpth (ft)	3.18	Conv. (cfs)		6478.7	
Conv. Total (cfs)	6478.7	Wetted Per. (ft)		60.86	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		2.60	
Min Ch El (ft)	532.00	Stream Power (lb/ft s)		28.44	
Alpha	1.00	Cum Volume (acre-ft)		0.21	
Frctn Loss (ft)	0.55	Cum SA (acres)		0.15	
C & E Loss (ft)					

Plan: Plan 02 CENTER CANYON ALL RS: 8 Profile: Max WS					
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	535.82	Wt. n-Val.		0.030	
Vel Head (ft)	1.19	Reach Len. (ft)	0.00	25.00	0.00
W.S. Elev (ft)	534.62	Flow Area (sq ft)		119.93	
Crit W.S. (ft)	534.90	Area (sq ft)		119.93	
E.G. Slope (ft/ft)	0.018388	Flow (cfs)		1050.15	
Q Total (cfs)	1050.15	Top Width (ft)		80.28	
Top Width (ft)	80.28	Avg. Vel. (ft/s)		8.76	
Vel Total (ft/s)	8.76	Hydr. Depth (ft)		1.49	
Max Chl Dpth (ft)	2.92	Conv. (cfs)		7744.4	
Conv. Total (cfs)	7744.4	Wetted Per. (ft)		80.57	
Length Wtd. (ft)	25.00	Shear (lb/sq ft)		1.71	
Min Ch El (ft)	531.70	Stream Power (lb/ft s)		14.96	
Alpha	1.00	Cum Volume (acre-ft)		0.15	
Frctn Loss (ft)	0.55	Cum SA (acres)		0.11	
C & E Loss (ft)					

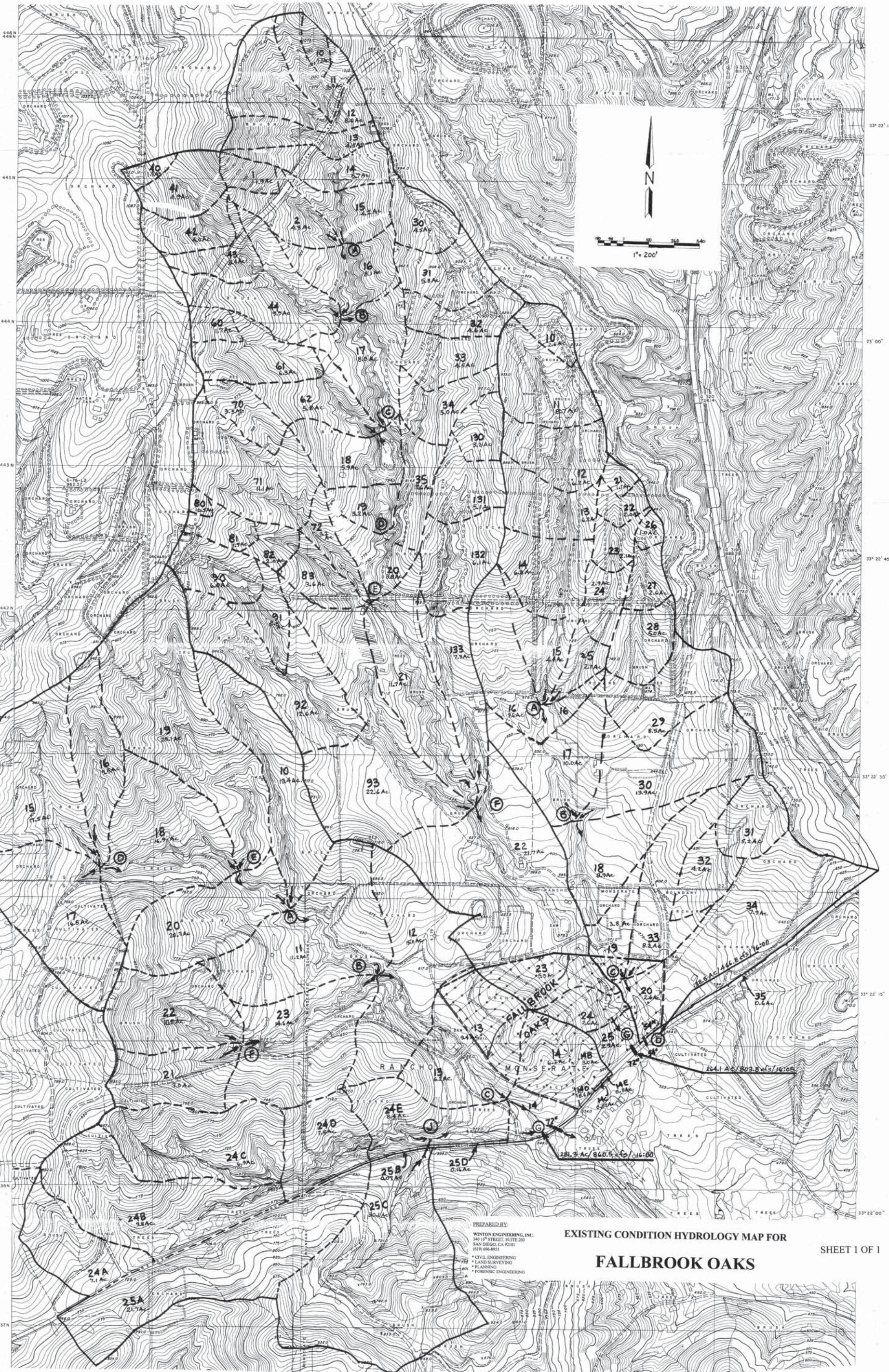
Plan: Plan 02 CENTER CANYON ALL RS: 7		Profile: Max WS			
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	535.67	Wt. n-Val.		0.030	
Vel Head (ft)	1.61	Reach Len. (ft)	0.00	37.00	0.00
W.S. Elev (ft)	534.05	Flow Area (sq ft)		102.93	
Crit W.S. (ft)	534.53	Area (sq ft)		102.93	
E.G. Slope (ft/ft)	0.026743	Flow (cfs)		1048.47	
Q Total (cfs)	1048.47	Top Width (ft)		72.60	
Top Width (ft)	72.60	Avg. Vel. (ft/s)		10.19	
Vel Total (ft/s)	10.19	Hydr. Depth (ft)		3.05	
Max Chl Dpth (ft)	3.05	Conv. (cfs)		6411.3	
Conv. Total (cfs)	6411.3	Wetted Per. (ft)		37.00	
Length Wtd. (ft)	37.00	Shear (lb/sq ft)		531.00	
Min Ch El (ft)	531.00	Stream Power (lb/ft s)		1.00	
Alpha	1.00	Cum Volume (acre-ft)		1.05	
Frctn Loss (ft)	1.05	Cum SA (acres)			0.06
C & E Loss (ft)					

Plan: Plan 02 CENTER CANYON ALL RS: 6		Profile: Max WS			
		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	534.75	Wt. n-Val.		0.030	
Vel Head (ft)	1.76	Reach Len. (ft)			
W.S. Elev (ft)	532.99	Flow Area (sq ft)		98.53	
Crit W.S. (ft)	533.52	Area (sq ft)		98.53	
E.G. Slope (ft/ft)	0.030427	Flow (cfs)		1047.60	
Q Total (cfs)	1047.60	Top Width (ft)		71.81	
Top Width (ft)	71.81	Avg. Vel. (ft/s)		10.63	
Vel Total (ft/s)	10.63	Hydr. Depth (ft)		2.99	
Max Chl Dpth (ft)	2.99	Conv. (cfs)		6005.7	
Conv. Total (cfs)	6005.7	Wetted Per. (ft)		37.00	
Length Wtd. (ft)	37.00	Shear (lb/sq ft)		530.00	
Min Ch El (ft)	530.00	Stream Power (lb/ft s)		1.00	
Alpha	1.00	Cum Volume (acre-ft)		1.05	
Frctn Loss (ft)	1.05	Cum SA (acres)			27.57
C & E Loss (ft)					

Chapter 12 - Existing Condition Hydrology Map



Chapter 13 - Developed Condition Hydrology Map



Chapter 14 - Map of 100-year Lines of Inundation

County Of San Diego Tract TM 5449 RPL 1

